BURMA GAZETTEER

MANDALAY DISTRICT

VOLUME A

made and marketed all the distinctive products of the Burmese people. A Gazetteer which succeeded in condensing within the allotted space all the information available would be unreadable. Mr. Ch. Duroiselle's Guide to the Mandalay Palace provides in [illegible] form all that the visitor will wish [illegible]
more detailed info[illegible]
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Mandalay District.

Schedule of pè between the Letkôkpin chaung *on the east and the Irrawaddy on the west.*

Abstract.	Original number.	Ayadaw.	Granted for maintenance.	Bobabaing.	Total.
Kaukkyi ...	577¼	175	234¾	167½	577½
Mayin ...	1168⅓	144⅓	728	296	1168⅓
Kaing ..	1411⅓	277	804¾	329½	1411⅓
Ya ...	821¼	791	14	16¼	821¼
Garden ...	924½	405½	131	388¼	924½
Available cultivation	323¾	323¾	...		323¾
	5226¾	2116½	1912½	1197½	5226¾
Unculturable hillocks and swamps	2780	...	...	...	2780
Total ...	8006¾	2116½	1912½	1197½	8006¾

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...ainfall ; Geology—
... series ; Ordo-
...ne, Devonian
...Deposits ;

BURMA GAZ...

THE MANDALAY DIST...

VOLUME A

COMPILED BY

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Settlement Officer, No. III Party.

Rangoon

Supdt., Govt. Printing and Stationery, Burma

1928

Price,—Rs. 7-8 = 11s. 3d.]

... an accessible ...
... to know; for those who want
...rmation the Gazetteer of Upper Burma
...ates provides a large amount of interesting
...r. In this volume we have confined ourselves
... which are of interest to those stationed in the
...ay District, and have avoided, as far as we could
...eproduction of information which is available in other
...ublications.

Among the Settlement Clerks Maung Maung's local knowledge and enthusiasm for research were invaluable; while Maung Gale (1) prepared the three maps which will be found at the end of the volume.

H. F. SEARLE,
Settlement Officer, No. 111 Party.

MANDALAY, 30*th October* 1925.

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BURMA GAZETTEER.

THE

MANDALAY DISTRICT.

VOLUME A.

CHAPTER I.

PHYSICAL DESCRIPTION.

General; Boundaries; Configuration; Rivers; Hills; River Floods; Lakes; Quagmire; Climate; Rainfall. Geology;—Archæan; Tawngpen system; Chaungmagyi series; Ordovician system; Silurian system; Plateau limestone, Devonian stage; Permo-Carboniferous section; Recent Deposits. Fauna—Snakes; Birds; Flora.

General. Mandalay District, the most northerly district of the Mandalay Division of Upper Burma, lies between $21^\circ 42'$ and $22^\circ 46'$ N. and between $95^\circ 54'$ and $96^\circ 46'$ E. with an area of 2,131 square miles.

Boundar It is bounded on the north by the Mogôk Subdivision of the Katha District; on the east by the Hsipaw State of the Northern Shan States; on the south by the Lawksawk State of the Southern Shan States, by the Kyauksè District, and by the Tada-u Township of the Sagaing District; and on the west by the Sagaing and Shwebo Districts. Of the gross area of the district, 427 square miles are occupied for cultivation and 669 square miles are Reserved Forest; of the balance 203 square miles are classed as culturable waste, and 832 square miles as not available for cultivation.

Configur tion. The main feature of the district is a wide plain, about 700 square miles in extent (of which about 400 square miles are occupied for cultivation), spreading from the Irrawaddy eastwards to the foot of the Shan Plateau, and gradually increasing in width from north to south. This

wedge-shaped plain slopes both southward and westward, and with the exception of the portions that are flooded by the Irrawaddy during the rains, or are irrigated from canals and tanks, is liable to drought owing to the uncertainty of the rainfall. To the north and east of the plain are the hills which form the western edge of the Shan Plateau, running, for the most part in broken parallels north and south. Those in the north, however, taking off from the Mogôk group, end abruptly in the Sagyin Hill, and cover about one half of the Singu Township. The highest points in this system are from 2,000 to 3,600 feet above sea level. The hills to the east take in the whole of the Maymyo Subdivision. They rise very steeply from the plain and develop into a picturesque plateau with an average height of 3,000 feet above sea level.

vers. Besides the Irrawaddy which skirts the district for 75 miles on its western boundary, the main rivers of the district are the Chaungmagyi and the Myitngè. Where the Irrawaddy enters the district at its northern end it is only half a mile wide and where it leaves it at its confluence with the Myitngè it is only three quarters of a mile wide. Between these two points it widens out considerably to two or three miles in the dry weather and sometimes as much as eight in the rains. It is studded with rich alluvial islands and is navigable all the year round by the largest river steamers. The Chaungmagyi, known also as the Madaya River and to the Shans as the Nam Pai, enters the district at its north-east corner and flowing south forms the boundary between it and the Shan States as far as the Maymyo Subdivision. A few miles south of this, it turns to the west at right angles and debouches from the hills at Sèdaw, where the headworks of the Mandalay canal are situated. It then flows westwards across the plain to join a branch of the Irrawaddy close to the Sagyin Hills. The old mouth of the Shwetachaung canal takes off from its southern bank midway between Sèdaw and the Irrawaddy. It is navigable in the rains for country boats as far up as Sagabin, a few miles west of Sèdaw; before the Mandalay canal was built it was navigable all the year round as far as this. The Myitngè or Doktawaddy, known in the Shan States as the Namtu, forms the southern boundary of the district flowing in a deep gorge through the hills; its bed is full of rapids and falls. It leaves the hills in a north-westerly direction near Kywetnapa at the foot of a 2000-foot bluff of the Myaleittaung in the Kyauksè District and

flows across the plain in a series of loops to join the Irrawaddy immediately north of Ava. Its channel in the plains is comparatively narrow and well defined by high banks, with no islands or sandbanks. It is navigable in the rains by country boats and small launches up to the point where it leaves the hills and in the dry weather as far as Gwebin though large dugouts are employed on the whole of its course through the plains all the year round.

Hills. Besides the hill masses already mentioned there are isolated hills rising from the Irrawaddy plain. North of the Chaungmagyi, the Shwemyindin, Magwetaya, Bodawtaung and Sagyin hills exclude the Irrawaddy from the country to the east, and though not continuous indicate the line of highest flood. Mandalay Hill, Yankintaung, and the Kalamadaung group rise abruptly from the level plain in the south-west of the district.

River floods. The western half of the district is flooded annually by the Irrawaddy. The higher portion of the inundated area is usually flooded from August to the middle of September but sometimes the high flood comes about the middle of July, subsides in September and comes again in October or November. In 1903 the ripening *kaukti* was entirely destroyed in July; in 1892 and again in 1903 the young *kaukkyi* plants were washed out in October. In 1901 the river did not rise sufficiently high and most of the land dependent on inundation was either left fallow or yielded poor crops. In 1904 during the third and fourth weeks of April there was an early rise of the river which damaged standing crops of hot weather paddy and miscellaneous dry crops on low-lying ground which had not yet been gathered. In 1905-06 abormal floods in the Irrawaddy did great damage not only to the paddy lands in the neighbourhood but also to early miscellaneous crops. In 1906-07 the Shwetachaung tract was badly flooded. In 1910-11 heavy floods in the Irrawaddy and Chaungmagyi rivers threw large areas out of cultivation in the Shwetachaung tract. In 1911-12 *kaing* and *kaukkyi* over large areas of the riverine tracts were again destroyed by floods from the Irrawaddy. In 1912-13 an unexpectedly late rise destroyed early pulses over a considerable area. In 1914-15 paddy in the riverine tracts was damaged by a late rise of the river. In July 1915 floods damaged the *kaukti* paddy. In 1916-17 an early rise destroyed some hot weather rice and a high rise in October destroyed or prevented the sowing of winter rice on riverine lands. In 1918-19 an early and

prolonged rise destroyed *kaukkyi* paddy in the riverine tract of Madaya Township.

Floods in the Chaungmagyi sometimes do great damage by breaching the irrigation works. In 1913 a flood in October burst the head-works of the Mandalay Canal and destroyed crops over 3,000 acres. The Myitngè annually floods low-lying land on its northern bank. Untimely floods from the hill streams do a great deal of damage to standing crops. If the floods fail early in the year the better class of *mogaung* paddy land gives a poor yield. If they come too late the lowest *mogaung* crops are washed away. The principal hill streams are the Kyauk *chaung*, the Malè *chaung*, the Kadetchin *chaung* and the Thèbyu *chaung* north of the Chaungmagyi, and the Kyetmaôk and Mèzali *chaungs* south of it. The Nadaunggya *chaung*, from which the Tônbo canal takes off, is also liable to heavy floods; on the 15th August 1917 they breached the Mandalay Canal south of the Mandalay-Lashio road causing considerable damage to the irrigated area below.

ve

kes.

There are only two lakes: the Shwepyi east of Tôngyi in the Singu Township and the Taungthaman near Amarapura. They are really lagoons fed from the Irrawaddy, which are used for fishing and cultivation when the river falls.

agmire,

In his 1888-89 Report Mr. Gibson describes certain land on the west of the Shwetachaung as follows: "In the kwin of Nammadawsa, Thayetkan north circle, there are about 150 acres of cultivated land which present some extraordinary features. This area is known as the *kosèko twin* or 99 pits on account of its peculiar nature. The crust or surface is a rich, black, loamy soil kept together by the interlacing of the roots of a thick luxurious creeping grass called *myetkyein*. It seems to be a wise dispensation of Providence that this grass is bitter in taste and consequently cattle will not graze in its vicinity, the shaky surface not being strong enough to bear their weight. It is firm enough for human beings to carry on cultivation by means of the spade and the pick-axe instead of the plough. In going over this ground I found, by thrusting a bamboo 12 feet long, that this surface of crust was about 3-foot thick, floating on what appears to be a clayey liquid."

Climate and Rainfall

The plains of the district fall within the dry zone. Statistics of temperature are scanty and relate only to Mandalay Town.

Year.	Average maximum temperature during			Average minimum temperature during		
	April.	July.	December.	April.	July.	December.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1901 ...	99·3	97·3	82·5	78·3	78·3	57·3
1902 ...	101·5	93·2	80·1	75·2	77·1	58·8
1903 ...	105·4	97·7	82·4	78·3	79·2	57·7
1920 ...	...	96·0	87·2	...	79·5	58·3
1921 ...	104·3	96·6	82·7	79,4	76·9	57·2
1922 ...	101·8	96·9	80·6	78·6	79·4	60·0

The following extract from the 1922-23 Settlement Report summarises the position as regards rainfall. "The average rainfall is 34 inches per annum in the southern parts of the district. At Singu, near the edge of the dry zone, it rises to 44 inches, and at Sèdaw, where the Chaungmagyi leaves the hills, it is 54 inches. Madaya itself has a recorded average of under 32 inches. The bare averages give no idea of the variations of the rainfall which could only be demonstrated by a series of graphs. A hundred and thirty years ago visitors to the district remarked that there was a summer season in July, and the figures bear this out to-day.

Station.	January March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Mandalay	·38	1·25	5·67	5·44	3·31	4·96	6·14	4·97	2·10	·53	34·75
Amarapura	·27	·98	6·02	5·05	3.03	4·92	6·47	4·73	1·92	·44	33·83
Madaya	·28	·72	5·36	4·72	2·79	5·50	5·84	4·74	2·06	·31	31·72

May, June, August, September and October supply five-sixths of the total rainfall. September is the wettest month and the rains end in November." Mr. Laurie noted that "there is among agriculturists of irrigated land a consensus of opinion that rain is, weight for weight, more valuable than irrigational water: at certain stages in the growth of the paddy plant (it) is particularly valuable, namely, when the ear is first forming inside, and when it is on the point of bursting out of its cover. The ear, once exposed to the air, does better without rain." In 1905 Mr. Gibson wrote: "The rainfall is on the whole capricious and, for the staple crop, inadequate. Paddy could not be successfully grown without the aid of irrigation." In 1921 Mr. C. F. Grant (the Deputy Commissioner) noted: "The rainfall is insufficient and capricious and if untimely may appear to be adequate in quantity though it is actually far from sufficient to mature a full crop." Mr. Gibson gives instances: "In 1900 the total rainfall in Mandalay Town was far below normal, barely two inches falling in October and November. In 1901 half the recorded rainfall fell during the months of May and June, and there was a long break causing agricultural operations to be delayed and transplanting of paddy was deferred till late in October resulting in light crops; and in many parts cultivators had to resort to broadcasting the less profitable paddy which matures in three months. In 1896 the early showers were in excess, and the middle and the late rains poor. The early and middle rains in 1899 and 1903 were timely and evenly distributed in the southern part of the district, but the October showers were harmfully in excess. In the northern part of the district in 1903 the early and later showers were good, but there was a long break between, causing seedlings to wither." Conditions have not improved since Mr. Gibson wrote. In 1904-05 the early and the middle rains were good but continued later rains affected the late wet weather harvest by producing much straw and little grain. In 1905-06 the rains were insufficient in July and August and also in October and November. In 1906-07 the early rains were scanty and affected the summer paddy crop adversely. The latter rains were untimely and insufficient and caused crop failures on unirrigated lands in irrigated tracts. In 1907-08 irrigation from minor canals was affected by scarcity of rain and island crops were poor. In 1908-09 the district suffered from drought and the unirrigated rice crop was a

failure. The late rains, though generally beneficial, caused the irrigated rice crop to thresh out light. In 1910-11 abnormal rain in May breached several canals and tanks. In 1911-12 failure of the late rains caused considerable loss in the upland crops and even in unirrigated areas the rice crop did not mature satisfactorily. In 1913-14 there was a shortage of rain in the upland tract. In 1914-15 the rainfall was above normal but badly distributed, failing at periods when specially required. In 1915-16 the early rains caused damage to the hot weather rice crop, which was being gathered, and suffered both in sheaf and unreaped. In 1916-17 sowing was late owing to the scantiness of the early rains, and consequently blight attacked the crops. In 1918-19 rainfall in May was fairly heavy, but was too early for *kaukkyi* cultivation ; the latter rains were scanty. In 1919-20 the early rains were unfavourable and the late rains irregular. In 1920-21 the season opened with heavy showers in the first week of May ; but after the first break hardly any rain fell until the middle of July. From then till the end of September the rainfall was light but adequate : the latter rains failed almost entirely. In 1921-22 the early rains were late and deficient : the middle rains were satisfactory and there was every prospect of a good harvest until heavy floods in October washed out the crops over large areas.

With regard to the effect of wind on paddy agriculture, Mr. Laurie writes that four or five inches of water are supplied to newly set paddy seedlings and from that time forward flushes of four inches at a time are let into the field when necessary. "The interval between each watering varies from seven to ten days, a clear sky, a hot sun, a drying wind being the causes which tend to shorten the intervals." From May to August a strong wind blows from the south-west ; when this has passed through rain-storms in Sagaing and Myingyan it is cool, and damp but more often it is hot and dry and very irritating. From the end of October till the beginning of the hot weather the prevailing breeze is from the north. Hence in the rains seedlings are planted with an inclination to the north-east, and in the cold and hot weather to the south-east. A hedge of plantain trees, set close together, is usually found on the south-west side of a plantain garden. Paddy seedlings which have grown too tall in the nursery have their stems clipped to afford less resistance to the wind. Strong winds are harmful to fruit trees when the

fruit is setting. In the hot weather there is hardly any dew and no mists; but in the cold weather heavy dew is expected, unless the latter rains have failed, and mists hang over sheets of water in tanks and lagoons until the sun is high in the sky.

ology.

Geologically the Mandalay District consists on the west of an alluvial plain from which emerge a few isolated hills, and on the north and east of hills continuous with the Mogôk hills and the Shan Plateau.

rchæan.

The oldest rocks in the Mandalay District are to be found in the hills of the Singu township and in the isolated hills, such as Mandalay Hill, which jut out of the alluvial plain of the Irrawaddy. They consist of crystalline limestone associated with gneiss and granite. This formation is continuous with that of the Ruby Mines area. In that area it is in the bands of crystalline limestone that the gems occur though they are actually recovered from alluvial detritus; rubies are also found in the same formation in the Sagyin Hills in the south of the Singu township. The age of the gneiss is Archæan; but it is not equally clear that the crystalline limestone is of the same age. Professor Judd is of opinion* that the limestone is definitely not of organic origin, being derived from alteration of the unstable scapolite contained in the basic gneisses; but Mr. T. H. D. La Touche considers† that much stronger evidence is required to prove that the limestone is not of different age and not of sedimentary origin. He classes it, however, for the present, with the gneiss.

wngpen item; aung-gyi series.

Between the gneisses of the Ruby Mines area and the fossiliferous rocks of the Shan Plateau occurs a group of strata which so far has not yielded fossils; this group has been given the name of the Tawngpen system by Mr. La Touche as it appears to be separated from succeeding strata by a well defined stratigraphical break. One of the subdivisions of that system has been called by him the "Chaungmagyi" series as it occurs on the left bank of that river occupying a narrow zone along the western edge of the plateau below the precipitous scarps of limestone. South of Sèdaw, where the river issues from the hills, this

* *Vide* Phil. Trans. Royal Soc., London, Vol. 187A. "The Rubies of Burma."

† *Vide* Memoirs of the Geological Survey of India, Vol. XXXIX, Part 3. "Geology of the Northern Shan States" by T. H. D. La Touche, M.A., F.G.S., from which most of the material for this note has been taken.

band continues southwards in a wedge to within a short distance of the Kyetmaŏk stream above the village of Taunggaung where it dies out among the Palaeozoic rocks which underlie the Plateau limestone. Another small exposure is found in a valley running down to the Myitngè near Lèma.

The Chaungmagyi rocks consist of a series of quartzites of red or brown colour, occasionally containing a little felspar, slaty shales, dark blue or black in colour, and sandstones. No conglomerates whatever have been observed among them. A small quantity of gold has been found in the streams that drain them. Their mode of weathering which results in their becoming rotten and decomposed when exposed to the atmosphere for any length of time, makes it difficult to distinguish them from the ordinary sandstones and shales such as are common among the succeeding formations, but the high angle of dip usually presented by these rocks may be taken as a guide. The absence of fossils makes the determination of their age a matter of uncertainty, but the evidence of stratigraphical position and lithological resemblances points to a pre-Cambrian origin, or possibly, as traces of alteration are very slight, to a place in the lowest division of the Cambrian system.

Ordovi[cian] system.

The formations comprising this system have received the following names in descending order :—

Nyaungbaw limestones.
Upper Naungkangyi stage.
Lower Naungkangyi stage.
Ngwetaung sandstones.

The Ngwetaung sandstones consist of coarse to fine grained brown sandstones, usually with a somewhat calcareous matrix, and sometimes enclosing thin lenticular bands of limestone. They form the crest and western slopes of the high range of hills culminating in the peak of Ngwetaung (3,403 feet) which rises boldly from the foothills due east of Mandalay. The foothills are of a more recent age being Devonian limestones. The sandstones contain no characteristic fossils, the only remains found in them being scattered fragments of crinoid stems and some very ill preserved specimens of a small *Orthis*.

The name Naungkangyi was given to the rocks of these two series as the first remains of Cystidean plates to be found were situated near the village of that name, two and a half miles to the north of Maymyo. It is probable that

the dual division allotted provisionally to these rocks will be found to be incomplete, when further investigation into the large number of fossils, found in them, has been completed.

The lower beds of this formation consist of yellow or buff colour sandy marls with strong lenticular bands of coarsely crystalline limestone, all containing fossils. It is probable that nearly all the beds were originally calcareous as they are sometimes found to pass into solid limestone when excavated. The calcareous matter has probably been leached out by weathering. It is extremely difficult to correlate the várious occurrences of these beds owing to the great variation in their lithological character and to the fact that in many cases particular forms of fossils have only been found in one locality. It is therefore necessary to describe briefly each outcrop.

Near Sèdaw, at the back of the hill up which the railway zigzags, fossils are found weathering out as hard limestone nodules from a thick band of papery shales; where the railway crosses the strike of these beds above the fourth reversing station these rocks are found only as hard, thin bedded, grey and reddish limestones in which only the faintest traces of fossils have been found. The lower Naungkangyis are separated from the Devonian limestones of which the bulk of the hill is composed by a fault running north and south along the bed of the ravine at the back of the hill and crossing the railway just below the third reversing station. The fossils are found scattered over the slopes on the eastern side of the ravine. They comprise Cystideans, bryozoan *Diplotrypa*, two species of which are by far the most common fossils found in this locality, and of the brachiopoda *Schizotreta* and *Rafinesquina imbrex*, a by no means exhaustive list. To the north the beds immediately overlying the Ngwetaung sandstones are yellow marls interspersed with thick bands of limestone. These beds extend from the base of the Ngwetaung ridge, where in a thin extension to the north traces of agentiferous galena have been found, eastward for several miles to Sakangyi, a short distance south of Taungkyun where a pinkish brown sandstone occurs as a veneer over the limestone beds; in this spot a large quantity of *Orthis elegantula* are to be found. These beds can be traced northwards along the eastern edge of the valley of the Kyetmaôk stream, forming a line of conspicuous cliffs overlying the Chaungmagyi rocks brought up by a fault along the floor of the valley. They

disappear in the high ridge overlooking Ônhlut between that place and Mèmauk; but appear again along the lower slopes of the lofty scarp forming the western edge of the plateau east of the Chaungmagyi river where they probably extend as far as the conspicuous peak of Hpataunggyi, of which they apparently form the western scarp. This hill is a few miles east of Gwegyaung on the Chaungmagyi and lies in the state of Mong Long. Between Sèdaw and Maymyo the lower Naungkangyis are exposed as inliers in one or two places, being probably brought up by anticlinal folds, as at Lebyaungbyan, five miles west of Maymyo, and at Makyinu and at several places on the road from Maymyo to the waterworks reservoir. Lower Naungkangyis have not been found at any place south of the railway line.

The unweathered limestones of the lower Naungkangyis have not as a rule yielded any recognizable fossils but are composed of an aggregate of somewhat coarsely crystalline grains of calcite and detached stem joints and ossicles of crinoids. This coarsely crystalline character, the presence of these ossicles and the absence of dolomite serve to distinguish them from the younger limestones of the plateau, which are as a rule more finely grained, are completely dolomitic and very rarely contain any traces of organic remains.

The Upper Naungkangyi strata have a much wider distribution at the surface than the lower Naungkangyis and after the plateau limestone constitute the most important formation occurring in these hills. They consist of peculiar argillaceous shales and claystones presenting a great variety of colours, from white through red to purple, a band of which, a few feet in thickness, is to be found over a wide area at the top of these variegated shales and is characteristic of these beds. In all cases they bear evidence of intense crushing, which has resulted in a kind of incipient cleavage often obliterating the original bedding planes so that the term shales hardly describes them correctly; the rock indeed often presents the appearance of a mass of clay that has been passed through a pug mill. This compression has resulted in a general contortion of the fossils, as in lower Naungkangyis. Fossils though fragmentary are exceedingly common and it is seldom that even a small piece of rock is broken without exposing at least the stem joint of a crinoid or cystidean. Detached plates of the calices of the latter are equally common as are also detached eyes of trilobites.

On the western side of the plateau these beds occupy a large area extending northwards from a line drawn along the base of the hills north of Maymyo as far as the Mèmauk Ônhlut spur. These beds are generally tilted up at a high angle or are vertical; but where they are exposed on the great 2,000 feet scarp north of Mèmauk they are found to be at the most 700 to 1,000 feet thick. To the south of the railway these beds cover a large area in the valley of the Nga-Pwe-sôn stream, east of the ridge bordering the Maymyo road between Pyintha and Zegôn, and reach down almost to the Myitngè. There is also a patch further west near Lungaung where these beds are exposed.

The Nyaungbaw sandstones are found on the Maymyo road near mile 21 at the top of the first ghât extending to within a mile of Nyaungbaw village where they disappear beneath the Plateau limestone; at the village they are brought up by a fault and extend to the top of the second ghat below Pyintha where they form a dip-slope extending along the hillside to the north as far as the railway. These rocks consist for the most part of red or chocolate brown limestones passing into grey or bright blue and sometimes purple. Banks of red clay are interbedded with the limestones and the latter usually contain a large amount of argillaceous matter presenting a peculiar lenticular structure, resembling the more calcareous portions of the purple band at the top of the Naungkangyis. *Camarocrinus Asiaticus*, the first fossil found on the plateau, was found in these beds between Yemaye and Pyintha. Its presence has led to the theory that these beds are more closely related to the Zibingyi beds of Silurian age; but stratigraphical evidence, in particular the absence of a whole formation, the Namhsin sandstone of Wenlock age (which on the Namtu attains a thickness of 2,000 feet), between the Nyaungbaw and Zibingyi beds in the western area, and also the decided unconformity of these two formations which are here found in contact, points to a considerable interval of time between their periods of deposition.

The local names given to the Silurian system in the Northern Shan States are in descending order :—

Upper Silurian	Zibingyi beds. Upper Namhsin. Lower Namhsin.
Llandovery ...	Panghsapye graptolite band.

Only the Upper Silurian beds are represented in the Mandalay District and of these beds the Namhsins occur only in a few places.

The lower Namhsin beds are found in one patch only, on the Mèmauk spur overlooking Onhlut. The occurrence here is completely isolated, the sandstones occupying a very small area surrounded by older rocks on which they rest unconformably. At the eastern end these beds rest on the Upper Naungkangyi variegated shales but at the western end they rest on the much older Chaungmagyi series. At the extreme western end the basement beds of the Namhsins consist of coarse conglomerates passing upwards into a series of rather coarse grained blue and purple felspathic grits and sandstones, in the more fine grained of which the fossils occur not far above the base of the series. Among these are found *Mimulus aunglokensis*,* the entire genus of which, with the exception of one variety, is confined to the Bohemian area where it occurs in a series corresponding to the Wenlock formation in England. *Orthonota spectabilis* also occurs, the genus *Orthonota* being characteristically Silurian. It is somewhat remarkable that although this patch of sandstone occurs near the edge of the plateau, along the top of which the plateau limestone is found in an unbroken line from north to south, no other trace of this sandstone has been detected at the base of these limestones which appear to rest directly on the top of the Naungkangyi beds. The sandstone therefore must have been deposited over a very limited area or else have been subjected to denudation before the limestones were formed

The upper Namhsin series, consisting of sandy marls with layers of very hard and compact limestones, though found over a very wide area in the Northern Shan States, occur in only one or two places in the Mandalay District. It is probable that these marly beds, in localities where the sandstones are not found beneath, are contemporaneous with them, the sandstones being laid down in the neighbourhood of a coast line, while the marls were being accumulated farther out to sea. These beds are probably present about a mile to the east of Zibingyi station below an outcrop of the Zibingyi beds exposed in a low cutting on the railway line at the base of the Pyintha ridge. The

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* Aunglokensis should more properly be Ônhlutensis, but Mr. LaTouche throughout spells Ônhlut as Aunglok.

marls are also exposed on the Maymyo road in a dip at the 32nd mile where the fossil trilobite, *Phacops shanensis*, is found in considerable numbers.

The Zibingyi beds are found at the base of the plateau limestones around the edge of the plateau on which the village of Zibingyi stands. There is also a poor outcrop to the west on the scarp overlooking the Sèdaw valley at the junction of the Naungkangyi beds and the plateau limestone. They are also exposed at several places near the crest of the ridge on the east of the Zibingyi plateau and form a narrow band running roughly parallel to the road from Pyintha northwards. They crop out on the road just before the 29th mile and then follow the crest of the ridge, crossing the road again at the 32nd mile near Kyinganaing. From the village of Waboye the Zibingyi band runs along the crest of the scarp bounding the Sèdaw valley and further outcrops to the north show that the band continues along the junction between the plateau limestone and the Naungkangyis northwards to the village of that name, north of Maymyo. There is a final appearance on the eastern side of the hills north of Maymyo, about a mile north of the village of Taungmyo.

These beds consist of a series of grey limestones in thin bedded regular layers containing numerous specimens of *Orthoceras* and an occasional trilobite. These layers are intercalated with more shaly carbonaceous layers crowded with *Tentaculites elegans*. Higher up the limestones are in thin regular bands separated by thicker layers of light coloured shales. They are followed by a dense black, somewhat earthy, limestone with thin partings of black shales in which graptolites occur associated with enormous numbers of *Tentaculites elegans*. The black limestones are succeeded by a series of flaggy white thin bedded limestones passing upwards quite conformably into the ordinary crushed type of plateau limestone. All these stages however are not exposed at each occurrence and near Kyinganaing the black limestones disappear, the beds consisting of very soft pink and lilac clays, crowded however with *Tentaculites elegans*.

The majority of fossils found in the Zibingyi beds are certainly of Silurian-Wenlock or Ludlow types, but the extraordinary profusion of *Tentaculites elegans*, a characteristic lower Devonian species, and the equally characteristic affinities of the few trilobites might lead to the supposition that in this region graptolites survived into

Devonian times and that these beds should be classified accordingly. However there is a strong analogy between the Zibingyi beds and the "passage beds" between Silurian and Devonian rocks in Shropshire where both graptolites and fossils, whose affinities lie with the overhanging Devonian rocks, are found side by side; those beds are generally accepted as Silurian and on that analogy the Zibingyi beds are classed as Silurian by Mr. La Touche.

Plateau Limestone Devonian stage.

This name is as appropriate as any that could be devised, for not only is this limestone the most widely prevailing rock that is found in the plateau of the Shan hills, but also to the peculiar constitution and mode of weathering of this rock are due the distinctive characteristics of the upland plateau. The prevailing type of scenery is somewhat monotonous, wide shallow valleys separated by low swelling hills or ridges succeeding each other, their outlines smoothed off by the universal covering of red clay, except in the few places were a scarp, usually indicating the line of a fault, presents a succession of precipitous cliffs to the view. The nature of the soil is thus described by Mr. La Touche (*loc. cit.*):—

"These rolling uplands are as a rule not well cultivated, for the soil is of poor quality and naturally supports little but coarse grasses and scattered oak trees and, where it has formerly been cleared for cultivation, a low scrubby jungle. It is only in the shallow valleys, where the soil is enriched by deposits of calcareous silt, and where water is easily obtainable by a system of irrigation channels that continuous cultivation can be carried on. Elsewhere, on the hill slopes, it is quickly impoverished, and the clearings will only produce crops for an average period of four years, after which they are allowed to lie fallow until the scrub has grown up again, when it is cut down and burnt, and the process is repeated. The water that falts on the slopes is either run off at once by the stiff impervious clay, or sinks deep below the surface through fissures in the limestone . . . . It is a curious fact that though the red clay has been derived to a great extent, if not entirely, from the disintegration of the limestone, analyses show that it contains no trace of lime.

Among wild plants the common bracken fern, *Pteris aquilina*, is found universally over the limestone area and is often of use in determining the limits of the formation when no outcrops are visible, though it is by no means confined to this area."

Within the Mandalay District the plateau limestones come down in a strip to meet the alluvium of the plains from the Myitngè in the south as far north as a point opposite Sagabin on the Chaungmagyi; to the north of this they are separated from the plain by the older crystalline Archaean rocks. The Maymyo plateau, to the south and east of the Sèdaw valley and the low hills to the north of the Maymyo road, is composed of this limestone almost entirely; but in the north of the Maymyo subdivision the plateau is composed of older rocks already described; the eastern boundary of the district from a point a few miles north-west of Wetwun corresponds almost exactly with the boundary between the plateau limestone and the Naungkangyi series.

The maximum thickness of this great mass of limestone is a point on which considerable doubt exists. There are only two places where the underlying rocks are visible and in both cases the upper limit of the formation cannot be fixed with any certainty as every vestige of overlying strata has been removed by denudation. In the deep gorge of the Myitngè at Lèma the plateau limestone rests on the Chaungmagyi series and a little to the west on Naungkangyi beds; the limestones are very little disturbed and the thickness seen is not less than 2,500 feet; the original thickness was probably not less than 3,000 feet. At the southern end of the great scarp south of Kyaukkyan, a few miles south-east of Wetwun over the border of the district, a fault has brought the underlying strata to the surface, but here again the limestones have suffered considerable denudation and no accurate estimate of their thickness can be made.

The prevailing type of plateau limestone is a whitish or light grey rock, weathering to a deeper grey, often stained red on the surface and along the joint planes by iron-oxide. It is hard enough to strike fire with a hammer and when struck gives out a fetid odour, due no doubt to the presence of decomposed organic matter. It is sandy to the touch and has a fine granular appearance, but is free from silicious matter except near its boundary with older formations when a very small proportion of silica or argillaceous matter is present. The limestones vary from a 99 per cent. pure calcite through dolomitic limestones to rocks containing carbonates of lime and magnesia in the proportion of 55 to 44 per cent., *i.e.* true dolomites. The pure limestones belong, however, to the Permo-carboniferous

horizon of the plateau limestone, while the massive, non-fossiliferous bulk of the formation yields an appreciable amount of magnesium carbonate. The conclusions arrived at by Mr. La Touche concerning the origin of these limestones is as follows.—

(1) The inappreciable amount of insoluble residue is in favour of the hypothesis that the limestones were formed under conditions similiar to those of modern coral reefs.

(2) The mineralogical changes that the rocks have undergone are similar to those which have affected the limestones of modern coral reefs, *viz*. the dolomitisation of the rock and the disappearance of the organisms that orginally composed them.

(3) The practically complete dolomitisation of the great mass of the plateau limestone is an indication that deposition took place in a slowly subsiding area, whereby sufficient time was allowed for the mineralising agents present in sea water to have complete effect.

(4) Conversely, the fact that the Permo-carboniferous band at the top of the formation has not been altered into dolomite is an indication, either of a more rapid subsidence, or what is more likely, seeing that it is followed by a break in deposition, of a comparatively rapid upheaval above the surface of the sea.

(5) Some of the dolomite in the rocks is of a secondary character, and has been deposited directly from solution in fissures and cavities.

A peculiar characteristic of the plateau limestone is the extraordinary manner in which it has been crushed, being traversed in all directions by a network of veins or fissures filled with secondary calcite or dolomite; when this filling has leached out, the rock is in such a pulverised condition that one blow of the hammer reduces it to a heap of ballast. The veins are often faulted across by other veins and slickensided surfaces are not uncommon, indicating that differential movements have taken place in the mass and that the movement has been at different times so that one set of veins could be filled up with solid material before a fresh movement took place. There are two possible explanations of this; one that brecciation is due to the effect of enormous stress, such as would be

set up by the great earth movements at the close of the Mesozoic period. As, however, the plateau limestones are not thrown into steep folds, it would appear that the limestone on what is now the plateau proper, was compelled to yield to pressure not by folding in the usual way but by faulting and by a general crushing of the formation as a whole. Another cause that may have produced this result, either by itself or in addition to the effects of tectonic stresses, may be deduced from the chemical composition of the rock. Ever since these rocks were raised above the level of the sea they have been liable to solution in water containing carbonic acid; judging by the enormous quantities of materials carried off at the present day by the streams and rivers, this must bear a considerable proportion to the whole. The removal of this matter in solution results in a settling down of the whole mass accentuated where fissures allow access to the surface waters. This theory accounts for the unusual brecciation caused and for the evidence of a long continuance of the action. The dolomitisation has destroyed the original structure of the rock to such an extent that it is rare to find any trace of organic remains in the plateau limestone, except in the upper formations; an occasional ossicle of a crinoid or a faint "dirt band," outlining what was once a coral, is all that is visible, with, in a few cases, very minute foraminifera. There is one notable exception, however, that of the Padaukpin coral reef. At Padaukpin, a village one mile to the east of Wetwun, there is an outcrop of some 50 yards in length extending northwards from the west end of the village, from which have weathered out in great numbers brachiopoda, corals, etc. All the characteristic fossils of the middle Devonian or Calceola stage of Western Europe are specially abundant, while there are very few definitely recognised species from higher middle Devonian beds or from still higher horizons. Nothing is yet known of the horizon of the Padaukpin beds in the great mass of the limestone surrounding them, as the base of the plateau limestone is not exposed for a distance of many miles in any direction and the dips are very irregular. The intermingling of species from different zones cannot be explained by the possibility of some fossils having been washed down from other beds, as the outcrop stands near the crest of a rise. It is probably due to deficiency of sedimentation. These fossils have long been known to the villagers and have been in some request

as charms; there is a tradition that Mindôn Min gave orders that excavations should be made as it was thought that such an abundance of these strange objects indicated the presence of treasure concealed below. The village of Wetwun itself is built upon a band of shales which are also fossiliferous to a considerable degree. These shales are very argillaceous, generally of a yellowish buff colour, mottled with pink or dark grey to black stains. They have been traced to within half a mile of the Padaukpin outcrop, but a ravine crossing the line of strike prevents the relation of one to the other being made out. These shale beds dip gently to the north towards the scarp and are faulted against it. Their true horizon would probably lie above the limestone which forms the scarp. The character of the fauna, which is completely dissimilar from that of the Padaukpin outcrop, points to a higher position in the series.

Permo-ca[r]boniferous section.

At various places on the Shan plateau patches of limestone of a character, different from that constituting the bulk of the formation are met with. They are generally dark blue, grey or black in colour forming rugged precipitous walls of rock capping ridges and knolls. Although the matrix of the rock is crystalline the individual crystals are exceedingly minute and the rock does not exhibit the sandy texture so characteristic of the ordinary Plateau limestone. They are in many cases highly carboniferous and in most cases the microscope reveals the presence of minute fragments of shells or foraminifera. In the spur which ends above Tônbo there is a band of this limestone containing a number of specimens of ***Fusulina elongata***. This band appears to pass vertically as well as horizontally into crystalline limestone of the usual type: it is therefore by no means certain that there is any difference in age between them. The evidence of chemical analysis, that these highest beds are composed of practically pure calcium carbonate, whereas the whole mass underlying them has been converted into dolomitic limestone, points, perhaps, to rapid upheaval after these higher limestones were laid down, following a period of long continued subsidence.

Rocks of Triassic and Jurassic age are not found within the Mandalay District: rocks of tertiary age are also missing, although tertiary deposits are found on the eastern side of the Sagaing hills on the right bank of the Irrawaddy.

Recent Deposits.

The plains of the Mandalay District consist, as has been said, entirely of river alluvium. Borings for wells have not,

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at a depth of 256 feet, penetrated the alluvium and found rocks of any description. Some doubt exists as to what rock forms the floor of the Mandalay plain, but it probably consists of the same formation as is found in the isolated hills which emerge at several places, namely Archean.

Mention should be made of two classes of recent deposits found in the hills, the red clay which forms a universal mantle over the plateau limestones, and the travertine or calcareous tufa deposited by the action of water. The clay is a bright Indian red and assumes a darker tint when wet. It generally contains little or no sand and is of a stiff tenacious character : it is usually filled with pisolitic nodules of iron oxide from the size of a pea to that of a walnut. In this it resembles laterite and it is probable that the same process accounts for both, that is, the decomposition of the underlying rock. In the case of the red clay the resulting product is less consolidated owing to the absence of silicious matter from the limestone. In thickness it is often as much as 30 or more feet and if the whole of this were to represent the residue remaining from the solution of the limestone, it would denote the decomposition of an enormous mass of rock, the average insoluble residue of the plateau limestone being less than 1 per cent. Though much of it must be attributed to this origin, it must have been largely supplemented by denudation of the bands of clay which are interstratified with the limestone.

The other rocks of which the hills are composed also weather into clays of various colours which give a clue to the rocks underlying them. Thus the Chaungmagyi series give variegated clays of light hues, while the Naungkangyi clays are also variegated but of darker tints. The Namhsin series weather into clays of brown, white or buff and generally sandy, while the Permo-carboniferous limestone gives rise to blue grey or yellow clays.

The mode of deposit of carbonate of lime, which is removed by water percolating through the limestone, as travertine in the beds of rivers is of some interest. Ordinarily in similar regions the percolating water trickles into caves and hollows in the rock and on evaporation deposits the lime in the form of stalactites and stalagmites : but in the Shan plateau there are no caves in the bulk of the limestone, owing to its universally shattered conditions which causes subsidence. Therefore in this region carbonate of lime is brought to the surface and thrown down in

the open. Even in the perennial rivers of the plateau these deposits take the form of dams or natural weirs from a few inches to six feet or more in height, extending from bank to bank and as level along the crest as if made by human agency. Very good examples are to be found in the Kelaung stream above Wetwun. These dams have all the appearance of being in an active state of growth after the manner of a coral reef, and the resemblance is the more striking as the growth is most rapid along the lip of the fall where the water is most agitated, so that the edge overhangs the pool below, just as the growth of a coral reef is most rapid where the waves strike it. However there is no indication in the travertine of any organic structure: but according to Mr. La Touche, the growth is due in a secondary way to organic causes. He found that wherever the surface of these dams was in a state of active growth it was clothed with fibres of a bright green moss; this itself apparently contained no carbonate of lime and consequently had no power of secreting it. The mode of growth appeared to be as follows:— In the first place sand and pebbles in the bed of the river when low, probably become coated with carbonate of lime which the moss finds a favourable soil and proceeds to cover with a network of fibres. These filter out the carbonate of lime from the water and the growth of the dam begins. The green surface is of a spongy nature and has a mamillated appearance caused by aggregations of particles of lime mingled with vegetable fibres. As the fibres decompose on being buried in the growing tufa, the carbonic acid thus liberated probably binds the moss together. The more rapid growth along the lip is no doubt due to the fact that here the intensity of the light is greatest, which favours the growth of the moss.

In addition to these dams, mosses of travertine are deposited by every spring and in the bed of every stream; the scarped cliffs and precipitous sides of gorges are generally festooned with huge mosses depending like curtains from their crests; where conditions are favourable these mosses may extend right across the gorge to form a natural bridge such as the famous one in the Gokteik Gorge.

Nearly all the species known to the *shikari* in Burma are to be found within the Mandalay District. The Elephant (*Elephas Indicus*), Burmese *taw-sin*, can be found at the foot of the hills during the rains, and in the cold weather throughout the district; in the Singu Township **Fauna.**

they come down as far as the Irrawaddy. They do considerable damage to ripe paddy, plantains and gardens; a herd of about 15 or 20 young bulls and cows comes every year into the Yema valley near Tônbo and stays for two months during the rains. Cultivation has been given up and the village of Yema abandoned owing to these incursions. Shootable bulls however are hard to find as they do not venture so far down as cows and young bulls.

The Gaur, usually known as the Bison (*Bog Gaurus* or *Gaveus Gauris*) Burmese *pyaung*, generally confines himself to the hills and foothills, only venturing down to the plains where he does not come across human beings. He has been found in the plains near Sèdaw and Kyauksè and in the Singu Township. Heads are generally of poor quality, though a fairly good bison was shot a year or two ago by the Hon'ble Mr. Justice Pratt near Anisakan.

The *saing* or Banting (*Bos Sondaicus*), unlike the bison, is fond of the plains wherever he can get good grazing near the foot of the hills; he grazes during the evening and at night, and retreats to the hills in the early morning for the day. There are few good heads known in the district and are difficult to get as the *saing* is an alert animal.

Sambhur (*Cervus Equinus*), Burmese *sat*, are found everywhere in the district where there is jungle for them to lie up. They do considerable damage to dry crops and to plantain gardens of which they are very fond. They are often killed by villagers who plant pointed stakes concealed in jungle and then drive the sambhur on to them.

The Hog Deer (*Cervus Porcinus*), Burmese *dayè*, is found throughout the district in scrub and grass jungle where there is an ample water supply, especially in the Madaya Subdivision. They can only be obtained by beating as the nature of the cover they are found in makes stalking impossible.

The Barking Deer (*Cervulus Aurens*), Burmese *gyi*, is found everywhere, even in well cultivated areas, although the number of guns in villages is increasing and the close season (June 15th to October 15th) is honoured solely in the breach.

Thamin are practically unknown.

The Wild Boar (*Sus Indicus*), Burmese *taw-wet*, is found everywhere both in the plains and on the hills, except in very well cultivated areas. They do considerable damage to crops.

The Bear (*Ursus Malayanus*), Burmese *wetwun*, is commonest in the hills though he is sometimes seen in the plains, especially between the Canal and the hills in the hot weather when the previous rains have been poor. They probably come to the canal for water when the hill streams fail.

The Serow (*Nemor Laedus Samatrensis*), Burmese *taw-seik*, is only found in very thick jungle in the hills above the 2,000-foot level.

Tigers (*Felis Tigris*), Burmese *kya*. can be shot practically anywhere in the district. In the dry weather they often come down to the Irrawaddy and lie up in dense thickets which give them excellent cover. Scantiness of water in the hill streams is, no doubt, one of the reasons for this; but the dryness of the hill jungle makes hunting very difficult, as the crackling of dry leaves betrays their presence and their prey can also see them at much greater distances. In these circumstances they resort to killing cattle and occasionally human beings.

Panther and Leopard (*Felis Pardus*), Burmese *thit*, are found in much the same haunts as the tiger but are not so common.

The Wild Dog, Burmese *taw-kwe*, is fortunately not very common but is found where there are jungle and game. They are almost invariably found in pairs. The jackal, in Burma a fairly uncommon animal, which the Burmese with singular ineptitude call the *kwe-a* or dumb dog, is known in the vicinity of Mandalay and an occasional one has been seen or heard near Lamaing.

Civet and Wild Cats, Burmese *taw-kyaung*, are fairly plentiful but owing to their nocturnal habits are rarely seen.

The Hare, Burmese *yon*, is found throughout the district, but is most plentiful between the canal and the hills.

The Otter, Burmese *pyan*, is fairly plentiful in the perennial streams and occasionally enters the Shwetachaung and Mandalay Canals in pursuit of fish to which it does considerable damage.

The Porcupine, Burmese *pyu*, is found throughout the district. Being of nocturnal habits it is not often seen.

The following article on the snakes of the Mandalay District has kindly been supplied by Colonel F. Wall, I.M.S. (retired). Snakes.

Family *Typhlopidae* (The Blind Snakes). Non-poisonous. These so-called blind snakes are not completely blind. The eyes are situated beneath the head shields and

vision is poor. They burrow and live beneath the soil, feeding on ants and the eggs and larvæ of beetles and ants. The two extremities are much alike and natives call them two-headed snakes. The scales are glossy and smooth. They are known by having no enlarged shields on the belly. Two species occur.

Typhlops Braminus (The Brahminy Snake). Usually taken for a worm. Very common in both hills and plains. Grows to six inches. Brown above, lighter on the belly. Has a minute point at tail tip.

Typhlops Diardi (Diard's Blind Snake). Burmese *Mywe-sin-pyit.* Very common in Hills and Plains. Grows to sixteen inches. Metallic olivaceous black above, dirty grey beneath. Has a minute point at tail tip.

Family *Boidae* (The Boas and Pythons). Non-poisonous. Dangerous for their size, strength and constricting powers.

Python Molurus (The Indian Python). Burmese *Sa-baon.* Fairly common in dense jungle in the plains and hills. Frequently ascends trees. Often submerges itself in water. Grows to twenty feet. Feeds on mammals, birds, reptiles. Known by the shields on the belly being twice as broad as the last row of scales. The scales at midbody are in from 60 to 75 rows of pale greyish yellow or fawn above with large dark irregularly shaped marks, down the back, and smaller ones in the flanks. Dirty whitish beneath without markings. A dark spear head mark on the head, The eye is cat-like with vertical pupil.

Family *Ilysiidae* (Non-poisonous. Cylindrophis Rufus Laurenti's Earth Snake). A rare snake in the plains and hills up to about 3,000 feet. Grows to two and a half feet. Lives beneath the soil. Known by the shields beneath the belly being less than twice as broad as the scale in the last row. The scales at midbody are in 19 rows. Iridescent black above, usually with a few brown half bars ending near the spine. Black beneath with many pale yellow cross-bars. A bright vermillion mark beneath the tail. The eye has an elliptical vertical pupil.

Family *Xenopeltidae.* (Non-poisonous Xenopeltis Unicolor. The Iridescent Earth Snake). Fairly common in the plains. Grows to four feet. Lives beneath the soil and feeds chiefly on rats and mice, but I have known it swallow birds, and other snakes. Known by the shields on the belly being two to two and a half times as broad as the scales in the last row, and having fifteen rows of scales over the back-Iridescent purplish black above, the young with a

yellowish or whitish collar. Belly whitish. The eye has a slightly elliptical and vertical pupil.

Family *Colubridae* (The Colubrines), Some are poisonous, others non-poisonous. Known by the shields on the belly being five to six times as broad as the scales in the last row, and having two pairs of shields in the middle of the chin.

Subfamily *Colubridae* (Non-poisonous, Nerodia Piscator. The Chequered Keelback). Burmese *Ye-mywe*. The commonest snake of the plains, extending into the hills up to about 5000 feet. Grows to three and a half feet. Attaches itself usually to rivers, tanks, paddy fields, etc. Feeds on frogs and toads chiefly and sometimes takes fish.. Fierce, frequently biting natives who approach it. Olivaceous-brown above, with a chessboard pattern of six rows of darker, sometimes intensely black spots. Pearly w ite beneath, unspotted. Two oblique black stripes from the eye, one downwards, the other passing towards the angle of the mouth. The scales at midbody are in 19 rows. Eye with round pupil.

Rhabdophis Stolatus (The Buff-striped Keelback). Burmese *mywe-shaw* and *myet-shaw*. After the last species it is the next commonest snake in the plains, and occurs in the hills up to above 5,000 feet. Grows to two and a half feet. Partial to damp places. Feeds on frogs and toads, Timid by nature, rarely if ever bitting anyone even when picked up. Olivaceous-brown with a pair of buff stripes down the back. Some dark bars across forebody. Scales on forebody where overlapped pale blue, in some specimens vermilion. Belly pearly white with a black spot on the side of some of the shields in forebody. Head olive-brown, with black edges to some of the shields bordering the upper lip. The scales at midbody are in 19 rows. Eye with round pupil.

Rhabdophis Subminiatus (The Vermilion-necked-Keelback). The commonest snake in the hills, much less common in the plains. Grows to three and a half feet. Lives on frogs and toads. Rich olive-green above, with a conspicuous patch of bright vermilion on the neck, bordered by canary-yellow in front. Behind the vermilion there is a chequering of canary yellow. Belly pearly white. Head olive-green above. A black streak below the eye. The scales at midbody are in 19 rows. Eye with round pupil.

Lycodon Aulicus (The common Wolf Snake). A very common snake in the plains, frequently coming

into houses. Will bite fiercely on provocation. Grows to about two feet. Lives mainly on wall lizards, but will sometimes devour mice. Brown above with pale yellow cross-bars, which expand in the flanks and are most conspicuous in the anterior half of the body. The belly is pearly white. The scales at midbody are in 17 rows. The eye is quite black in life, but some time after death the pupil can be seen to be vertical as in the cat.

Lycodon Fasciatus (Anderson's Wolf Snake) Rather an uncommon snake. confined to the hills, Grows to three feet, fierce. Lives on small lizards, and occasionally small snakes. It is girdled with black, and yellow or dove-coloured bands which have very jagged outlines. There are from 23 to 38 of these on the body and 14 to 20 on the tail. The head is black above, and the lips mottled with black. The scales at midbody are in 17 rows. Eyes like the last. Often mistaken for the banded Krait, but is easily distinguished by the median row of scales on the back not being enlarged.

Ptyas Mucosus. (The Dhaman or Common Rat Snake). Burmese *Mywe-let pat* and *Lim-mywe.* One of the commonest snakes in both plains and hills. Grows to over eight feet. Will attack if cornered, but usually speeds away if approached. Frequently climbs trees, and gets into houses. Feeds on rats, mice, bats, birds, frogs and toads. Olivaceous-green or brown, sometimes tending towards blackish above, the edges of many of the scales quite black, forming irregular linear cross bars most conspicuous in the midbody. Belly pearly white or yellow, the edges of the shields black. The head is olivaceous-brown, and the shields on the sides, lips, throat and sides of neck edged black. The scales at midbody are in 17 rows. Eye with round pupil.

Zamenis Korros (Schlegel's Rat Snake). Fairly common in the plains, extending to about 5,000 feet into the hills. Grows to seven feet. Feeds on rats, mice, frogs and toads. Very like the last in general appearance, but the scales in the middle of the body are in 15 rows, whereas in *Mucosus* they are in 17 rows. Eye with round pupil.

Coluber Prasinus (Blyth's Coluber). An uncommon denizen of the hills above about 3,000 feet. Grows to three and a half feet. Lives in bushes and trees. Probably feeds on lizards. A vivid leaf green above, rather paler beneath. Usually a somewhat indistinct pale stripe in the

flanks. The scales are in 19 rows at midbody. Eye with round pupil.

Coluber Porphyraceus (The Broad-barred Coluber). A somewhat uncommon snake confined to hills above about 3,000 feet. Grows to three and a half feet. Probably feeds on small mammals. A very handsome and distinctively coloured species Buff, fawn, to raw-beef colour above with from 14 to 18 bars across the body and 4 across the tail. These bars have a pale outer zone within which is a dark purplish-black zone within which again the colour resembles that of the prevailing hue of the back. The head is coloured like the back and has a purplish black stripe in the middle of the crown. A similar stripe passes from the eye down the body. Pale pinkish or yellowish on the belly, unspotted. The scales at midbody are in 19 rows. Eye with round pupil.

Coluber Radiatus. (The Copper-headed Coluber). A fairly common species in the plains. Grows to seven feet. Feeds entirely on rats and mice. Tawny hued on the back, with two or three black stripes running down each side of the fore-body. Belly pearly white or yellowish, more or less obscurely mottled with greyish which is most evident posteriorly. Head copper coloured or dull orange with a black cross bar at the back. Three black lines radiate from the eye, one to the cross bar, one towards the angle of the mouth, and one below to the edge of the lip. The scales at midbody are in 19 rows. Eye with round pupil.

Dendrophis Pictus (Gmelin's Bronze Back). A rather uncommon snake in the plains, ascending hills to about 4,000 feet. Grows to four feet. A very handsome snake of very slim proportions, living in bushes and trees. Feeds on lizards and tree frogs. Rich bronze on the back, the overlapped parts of the scales in the forebody being bright blue. Usually there is a buff stripe in the flanks which is sometimes outlined with black. Belly greenish, greyish or yellowish. Head bronze above, the lips pale. The scales at midbody are in 15 rows, the median row enlarged. Eye with round pupil.

Oligodon Theobaldi (Theobald's Kukri Snake). Not uncommon in the plains. Grows to one and a half feet. Feeds on the eggs of lizards and snakes and crickets. Fawn coloured on the back, with more or less distinct darker stripes running down the body. Variegated with short dark streaks, with a tendency to form crossbars. Belly whitish or yellowish, sometimes suffused with pinkish in

the hind part, with few or no dark spots. Head pale brown with a dark bar across the front of the eyes, a Λ shaped mark at the back. The scales at midbody are in 19 rows. Eye with round pupil.

Oligodon Violaceus (The Violaceous Kukri Snake). Rather uncommon. A snake of the plains and hills up to about 5,000 feet. Grows to two and a half feet. Feeds on the eggs of lizards and snakes and snails. Very variable in colouration. Some are coloured uniformly above like a boiled prawn, some are light and others dark brown, others again a rich deep ruddy brown. One variety has from 19 to 27 more or less distinct dark crossbars on the body, and 3 to 7 on the tail, with a less distinct series of intermediate bars alternating with the latter. The belly is whitish or pinkish in the ruddy backed specimens, and may have a few light or many dark squarish spots at the sides. The head has the same markings as the last species more or less distinct These marks are charateristic of all the kukri snakes. The scales over the middle of the body are in 17 rows. Eye with round pupil.

Oligodon Cruentatus (The Crimson-tailed Kukri Snake). Fairly common in the plains. Grows to about fifteen inches. Feeds on snakes and lizards' eggs Light brown above with a variegation of short darker and lighter oblique streaks. A more or less distinct darker stripe down each side of the back, and a narrower one below this. Belly yellow with dark squarish spots at the sides. Vivid crimson beneath the tail. Head marked as in *theobaldi*. The scales are in 17 rows at midbody. Eye with round pupil.

Oligodon Albocinctus (The Light-barred Kukri Snake). A rather uncommon snake in hills. Grows to three feet. Feeds on mice, the eggs of snakes and lizards, and occasionally insects like crickets. Brown or ruddy-brown above with from 19 to 27 light black-edged bars across the body, and 4 to 8 on the tail. Whitish or yellowish beneath (pinkish in ruddy backed specimens) with dark squarish spots at the sides. Head marks as in *theobaldi*. The scales at midbody are in 19 or 21 rows. Eye with round pupil.

Oligodon Purpurascens (Schlegel's Kukri Snake). Very common in the hills. Grows to three feet. Feeds on snakes and lizards' eggs, and occasionally toads and frogs. Very variable in its markings. Light or dark brown above sometimes with a ruddy tone. A more or less distinct variegation of short darker and lighter streaks

sometimes present. A darker stripe runs down each side of the body, and a narrower one below this. Some specimens have from 9 to 13 dark cross bars on the body, and 2 to 4 on the tail. These bars consist of 4 spots more or less connected, the median two being the larger. Belly whitish with a few or many dark squarish spots at the sides. Head with markings as in *theobaldi*. The scale rows in midbody number 19 usually, rarely 21. Eye with round pupil.

Oligodon Splendidus (The Ornate Kukri Snake). An uncommon denizen of the plains. Grows to over two feet. Pale brown above, each scale with a dark spot. From 14 to 18 large dark spots on the body, and 2 to 5 on the tail. These spots are indented in front and behind down the spine. The scales are in 21 rows over the middle of the body. Eye with round pupil.

Sub-family *Homalopsinae* (Water Snakes). Non-poisonous. Inhabit rivers, lakes, moats, etc.

Hypsirhina Plumbea. (Boie's Water Snake). An uncommon species which I have had from the moat round Fort Dufferin. Grows to about three feet. Feeds on fish and frogs. Olive-green or olive-brown above with sometimes a series of small blackish spots down the spine. Belly and last two and a half rows of scales pale yellow. Sometimes small blackish dots down the middle, and a zigzag dark line at the edge of the belly shields. Head coloured like back above, merging to pale yellow on the upper lip. The scales at midbody are in 19 rows. Eye with vertical pupil.

Hypsirhina Enhydris (Schneider's water snake). Common in the moat and subsidiary channels within the Fort at Mandalay and in paddy fields. Grows to two and a half feet. Feeds on fishes and frogs. Olive-green above. Belly pale yellow with three dark lines, one in the middle and one at the edge of the belly shield. The scales are in 21 (rarely 23 rows) in the middle of the body. Eye with vertical pupil.

Sub-family *Dipsadomorphinae*. (Tree Snakes Non-poisonous.)

Dipsadmorphus Multimaculatus.—The Argus Cat Snake. A fairly common snake in both plains and hills. Living in bushes and trees, it sometimes obtrudes itself into houses, even upstairs, having scaled the creepers. It is fierce and will bite readily. Moves rapidly in and about foliage, but less so when on the ground. Grows to three feet. Feeds on lizards. A very handsome snake. Above pale brown, with a series of large oval

detached dark spots down each side of the body, and beautiful mottlings in the flanks. Belly pale greyish or whitish marbled with dark tones, and a row of small dark spots on each side. Head with a pair of dark subtriangular marks at the back of the crown, and a dark streak from the eye to the angle of the mouth. The scales at midbody are in 19 rows, and the median row is enlarged. Sometimes mistaken for Russell's viper, but this latter has three rows of large spots down the body, only small scales on the head and from 27 to 31 rows of scales at midbody the median not enlarged. Eye cat-like with vertical pupil.

Dipsadomorphus Hexagonotus. (The Tawny Cat Snake.) A rather uncommon tree snake to be found in both plains and hills. Habits like the last. Grows to three feet. Lives on lizards. Uniform tawny above and below, the belly in some clouded with darker tones. A dark streak from the eye to the angle of the mouth. The scales are in 19 rows at midbody, and the median enlarged. Eye cat-like with vertical pupil.

Boiga Cyanea. (The Green Cat Snake.) An uncommon tree snake in plains and hills. Habits like *multimaculatus*. Grows to four and a half feet. Lives on lizards. A uniform vivid grass green, which rapidly becomes a beautiful blue when immersed in spirit. The scales are in 21 rows at midbody, the median row enlarged. Eye cat-like with vertical pupil.

Boiga Cynodon. (Boie's Cat Snake.) An uncommon tree snake found in the plains and low hills. Habits like *multimaculatus*. Lives on lizards. Grows to over six feet. Pale brown above with dark spots arranged in irregular cross bars. Dark mottling in the flanks. Belly pale grey or brown, uniform, or clouded with darker hues. A dark streak from the eye to the corner of the mouth. The scales are in 23 or 25 rows at midbody, the median row enlarged. Eye cat-like with vertical pupil.

Psammophis Condanarus. (Merrem's Tree Snake.) A rare tree snake in the plains and hills up to 5,000 feet. Lives on lizards. Grows to three feet. Above with alternate stripes of yellow and brown (5), running down the back. These are all continued on to the head, the lowest brown passing through the eye, the second over the eyes. The belly is yellow with a dark line at the side. The scales are in 17 rows at midbody. Eye with round pupil.

Psammodynastes Pulverulentus. (The Mock Viper.) A somewhat uncommon snake in plains and hills confined

to heavy jungle. Fierce. Feeds on lizards. Grows to two feet. Rather stout and extremely like a viper. Pale brown or yellowish above with darker and lighter pepperings or mottlings, very variable in degree and distribution. Belly powdered with brown with a tendency to form linear stripes. Head with linear stripes, and a streak passing through the eye. The scales are in 17 rows in midbody. Eye with vertical pupil.

Dryophis Prasinus, (Boie's Whip Snake.) Burmese *Mywe-sein and Mywe-sein-myi-she*. A fairly common species in both plains and hills, living in shrubs and trees. Feeds chiefly on lizards, but plunders birds' nests with young. Grows to five feet. Verdant green above, paler on the belly. A yellow or white line runs along the flanks. Scales are in 15 rows at midbody, the median slightly enlarged. Eye with horizontal pupil as in goats and sheep.

Dryophis Mycterizans. (The Common Green Whip Snake.) Burmese *mywe-sein* and *mywe-sein-myi-she*. A common snake living in trees and bushes. Grows to six feet. Feeds on lizards principally, plunders birds' nests, and will eat mice and, rarely, other snakes. Verdant green above, paler on the belly. A yellow or white line in the flanks. Scales in 15 rows at midbody Eye with horizontal pupil. Known from the last by its very pointed snout.

Chrysopelea Ornata. (Tne Gold and Black Tree Snake.) A common tree snake in the plains of striking beauty. Frequently enters houses by scaling the creepers. Lives on wall and other lizards, bats and birds. Grows to four and a half feet. Bright yellow above with black ornamentation very variable in extent and distribution. Belly yellow with black crossbars. Scales in 17 rows at midbody. Eye with round pupil.

Sub-family *Elapinae*. Poisonous.

Bungarus Fasciatus. (The Banded Krait.) Burmese *Ngan-dawgya, Nat-mywe* and *ngan-than-kwin-sut*. A common snake in the plains, rarely seen in the hills. An extremely sluggish snake, that behaves as if it has been deeply drugged, rarely moving out of one's way, and very rarely biting even on the greatest provocation. Burmese say it is not poisonous, but this is a mistake. I know of no instnace of a fatal issue attending the bite. Grows to six feet. Feeds exclusively on other snakes. Alternately banded with broad belts of bright yellow and black, the latter numbering from 16 to 27 round the body and 2 to 5 round the tail. The scales at midbody are in 15 rows, the median much

enlarged. Tail blunt and finger-like. Eye quite black in life, the pupil, visible after immersion in spirit, round.

Bungarus Multicinctus. (Blyth's Krait.) A rare species in the plains and hills occurring up to 5,000 feet. It is not known if the bite carries fatal effect. Feeds on other snakes. Grows to a little over three feet. Black above with from 30 to 48 white bands round the body and from 10 to 13 round the tail. The scales at midbody are in 15 rows, the median much enlarged. Eye as in *fasciatus*. Tail pointed.

Bungarus Magnimaculatus. (The Large-Spotted Krait.) A somewhat uncommon species in the plains. It is not known if the bite is fatal. Feeds on other snakes. Grows to four feet. Black above with from 11 to 14 broad white bands on the body, and 2 to 3 on the tail. These bands are streaked with black as if with a comb. The scales at midbody are in 15 rows, the median much enlarged. Eye as in *fasciatus*. Tail pointed.

Naia Hannah. (The Hamadryad or King Cobra.) Burmese *Ngan*, or *Ngan-bok*. A fairly common snake in the plains, less so in hills up to about 6,000 feet. The bite is usually fatal. A formidable snake on account of its size, and the fact that it sometimes attacks people with little or no provocation. Erects a "hood" like the cobra when alarmed. Frequently climbs trees, and takes readily to water. Feeds on other snakes, and less commonly on the monitor lizard called *put* by the Burmese. Grows to fifteen feet. Olive brown to blackish above with more or less conspicuous lighter broad bands. These bands number 32 to 43 on the body, 11 to 13 on the tail and become more and more indistinct as the snake ages. The young are coalblack with white bands. The head is barred with white. The scales number 15 rows in midbody. Eye with round pupil.

Naia Naia. (The Cobra). Burmese *Mywe-hauk*. A very common species in the plains, rarely ascending hills in this district, and then not, or rarely above 3,000 feet. The bite is frequently fatal, but probably as many as 50 per cent. of casualties escape a lethal dose. Prefers escape to attack, and therefore rarely bites unless suddenly encountered. Grows to between five and six feet. Feeds on rats, and mice, frogs, toads, and rarely swallows other snakes. Varying shades of brown above variegated or mottled with darker tones. A black ellipse or U with a

central spot on the hood usually, more rarely a spectacle-mark. Belly dirty white or grey with darker mottlings, and two to four dark crossbars in forebody. Scales rows 21 at midbody. Eye with round pupil.

Calliophis Macclellandi (McClelland's Coral Snake.) A fairly common snake confined to hills. It is not known if the poison is fatal to human beings. A somewhat sluggish snake of timid disposition. Grows to two and a half feet. Feeds entirely on other snakes, usually devouring blind snakes. Cherry-red above with from 16 to 26 linear black bands. Belly yellow with irregular-shaped black blotches between the bands. Head black with an enamel white bar across the eyes. Scales in 13 rows at midbody. Eye with round pupil.

Family Amblycephalidaes Slug Snakes.) Non-poisonous.

Amblycehalus Macularius. (Theobald's Slug Snake.) A rare snake confined to hills above about 3,000 feet. Grows to sixteen inches. Feeds entirely on slugs and snails. Above uniform neutral tint, usually with a few small whitish spots disposed to form bars. Belly beautifully marbled with the same tones. The scales are in 15 rows at midbody. Eye large with a cat-like vertical pupil.

Family Viperidae. (The Vipers.) Poisonous.

Vipera Russelli. (Russell's Viper.) Burmese *Mywebwe.* A common species in the plains, rarely ascending hills to as much as 3,000 feet. The bite is frequently fatal but probably about 40 per cent. of casualties do not receive a lethal dose of venom. A very sluggish reptile, that holds its ground in preference to escape. It has a very loud hiss, which warns many of its proximity and anger, and gives time to avoid being bitten. Grows to five feet. Lives on rats and mice. Buff or pale brown above with three series of large dark spots down the back. These spots are often outlined with white or pale buff. The belly is pearly white, and is mottled with darkish semilunar spots. The scales on the back at midbody are in from 27 to 33 rows. Eye cat-like with vertical pupil.

Trimeresurus Gramineus. (The Green Pit Viper.) Burmese *Mywe-sein.* A fairly common species, more so in low hills than the plains. The poison is never fatal to man. Grows to three and a half feet. Feeds chiefly on rats and mice but will devour birds, lizards, frogs and occasionally other snakes. It is uniform grass-green above, pale green, bluish or yellowish below and has a yellow or white line running along the flanks. The scales at midbody are

usually in 21 rows, rarely 19 or 23. The eye is cat-like with vertical pupil.

Trimeresurus Monticola. (Stoliczka's Pit Viper.) Confined to hills above about 4,000 feet. No fatal case has been recorded from its bite. Sluggish by habit and fierce. Feeds on small mammals chiefly. Grows to three feet. Light brown above with dark brown blotches and mottlings of very variable distribution. Belly whitish more or less sullied or spotted with brown. The scale rows at midbody are 21, 23 or rarely 25. The eye is cat-like with vertical pupil.

Birds. The following note on the birds of the district has kindly been supplied by Mr. P. F. Wickham, Chief Engineer, Shan States.

As far as description of the Ornithology of the Mandalay district is concerned, it is perhaps unfortunate that the issue of the Gazetteer coincides with the revision, as yet incomplete, of the nomenclature of Indian birds. Systematic ornithologists have now decided to use the trinomial (Species and sub-species) system of nomenclature and thus where the recognized standard work on ornithology (Fauna of British India, 1889) described 1,617 birds as separate species, the revised edition will describe nearly 2,200 birds, but actual species are reduced to about 1,420.

Comprising very variable climatic conditions, the capital itself being in the " Dry Zone " of Burma and hills averaging 3,500 feet in height being included, the Mandalay district is interesting from an ornithological point of view.

The " Dry Zone " area, although its rainfall is very small, is well watered, being served by the Irrawaddy River which by overflowing its banks provides inland lakes, always an attraction to bird life and wet cultivation being made possible by irrigation, the district offers for the sportsman possibilities equal to anywhere in the Province ; good bags are made of duck and snipe, and jungle fowl near the foothills are plentiful. In the hills themselves peacock, jungle fowl, partridge, snipe and pheasant with the rarer wood-cock and woodsnipe are found.

Of the 2,200 birds now recorded in the Indian Empire, 235 certainly live and die in the Mandalay District. Some 19 more birds are probably to be found only as occasional visitors and to these numbers must be added the migratory and generally cold weather visitants, 65 in number.

The province of Burma has contributed to the fauna of

India its share of species and sub-species of birds, the latter being evolved from geographical distribution and some of the most typical species of these Burmese birds, having their home in this district and Burma but not found in India proper are :—

Hooded Rucket-tailed Magpie.	Rufous-winged Buzzard Eagle
White-throated Babbler	Burmese Peafowl
Blandford's Bulbul	Chinese Francolin
Burmese Shrike	Chinese Silver Pheasant
Pegu House Sparrow	Indigenous sub-species being too many to be enumerated.

The English name is given in the lists below with the newest scientific name which however may not be quite accurate as the revised nomenclature is not quite decided. There is at least one hill in the district which reaches a height of nearly 5,000 feet, this hill although probably providing no species new to science, would at any rate, add a few species to the Mandalay district list as now recorded, if it had been at any time explored.

The numbers of migrants, specially amongst the large family of warblers (Sylviidae) might also be capable of expansion.

Some Burmese names are given but the Burmese names of birds are usually very local and are mostly "popular" names. Birds are named either from their "call" or some other characteristic and the general names are applied to all of one family.

The lists of Mr. K. C. Macdonald and Colonel H H. Harington of Myingyan and Maymyo, respectively written for the Journal of the Bombay Natural History Society have been greatly utilized in compiling this record as also the new Hand List by E. C. Stuart Baker published by the same Society.

List of Resident Birds.

Mandalay District.

Jungle Crow (Corvus coronoides Andamanensis).
House Crow (Corvus splendens insolens).
Red-billed Blue Magpie (Urcissa melenocephela magnirostris).
Indian Tree-pie (Dendrocitta rufa rufa).

Burmese Tree-Pie (Dendrocitta sinensis assimilis).
Hooded racket-tailed Magpie Crypsirhina cucullata).
Burmese Jay (Garrulus leucotis leucotis).
Grey Tit (Parus major commixtus).
Sultan Tit (Melanochlora sultanea sultanea).
White-browed Laughing Thrush (Dryonastes Sannio).
White crested Laughing Thrush (Garrulax leucolophus belangeri).
Black gorgeted Laughing Thrush (Garrulax pectoralis pectoralis).
Necklaced Laughing Thrush (Garrulax moniliger moniliger).
Striated Babbler (Argya earlii).
Common Babbler (Argya caudata caudata).
White throated Babbler (Argya gularis).
Harington's Shan Scimitar Babbler (Pomatorhinus olivaceus ripponi).
Red-capped Babbler (Timalia pileata jerdoni).
Yellow-eyed Babbler (Pyctorhis sinesis sinensis).
Sharpe's Spotted Babbler (Pellorneum ruficeps minus).
Malayan Spotted Babbler (Pellorneum ruficeps subochraceum).
Yellow-breasted Babbler (Mixornis rubricapilla rubricapilla).
Common Iora (Aegithina tiphia tiphia).
Gold-fronted Chloropsis (Chloropsis aurifrons aurifrons)
Red-vented Bulbul (molpastes haemorrhous burmanicus).
Red-whiskered Bulbul (Otocompsa emeria emeria).
Black-crested Yellow Bulbul (Otocompsa flaviventris flaviventris).
Blandford's Bulbul (Pycnonotus blandfordi).
Burmese Nuthatch (sitta castaneiventris neglecta).
Velvet-fronted Nuthatch (Sitta frontalis frontalis).
Black Drongo (Dicrurus macrocecrus cathoecus).
Grey Drongo (Dicrurus lencophaeus nigrescens).
Bronzed Drongo (Chaptia aenea aenea).
Hair-crested Drongo (Chibia hottentotta hottentotta).
Racket-tailed Drongo (Dissemurus paradiseus rangoonensis).
Tree-creeper (Certhia discolor discolor).
Great Reed Warbler (Acrocephalus stentoreus brunnescens).
Tailor Bird (Orthotomus sutorius sutorius).
Rufous Fantail Warbler (Citicola cisticola cursitans).

Franklin's Wren Warbler (Franklinia gracilis).
Beavan's Wren Warbler (Franklinia rufescens).
Striated Marsh Warbler (Megalurus palustris).
Brown Hill Warbler [(Suya crinigera cooki (?).]
Yellow-bellied Wren Warbler (Prinia flaviventris flaviventris).
Indian Wren Warbler (Prinia inornata inornata).
Chin Hills Wren Warbler (Prinia inornata Burmanica).
Black headed Shrike (Lanius nigriceps nigriceps).
Brown backed Pied Shrike (Hemipus picatus capatalis).
Common Wood Shrike (Tephrodornis pondicerianus).
Scarlet Minivet (Pericrocotus speciosus fraterculus).
Posy Minivet (Pericrocotus roseus roseus).
Small Minivet (Pericrocotus peregrinus vividus).
Pale Grey Cuckoo Shrike (Campophaga melaschista melanoptera).
Large Cuckoo Shrike (Graucalus macei siamensis).
Ashy Swallow Shrike (Artamus fuscus).
Black-naped Oriole (Oriolus indicus tenuirostris).
Black-headed Oriole (Oriolus luteolus luteolus).
White-winged Mynah (Sturria malabarica nemoricola).
Black-necked Mynah (Grauculipica nigricollis).
Jerdon's Mynah (Grauculipica burmanica burmanica).
Common Mynah (Acridotheres tristis tristis).
Jungle Mynah (Aethiopsar fuscus infuscatus).
Collared Mynah (Aethiopsar albocinctus).
Pied Mynah (Sturnopastor contra superciliaris).
Blue-throated Fly-Catcher (Cyornis rubeculoides).
Grey-headed Fly-Catcher (Culicicapa ceylonensis).
Paradise Fly-Catcher (Terpsephone paradisi affinis).
Black-naped Fly-Catcher (Hypothymis azurea styani).
White-browed Fantail Fly-Catcher (Rhipidura aureola burmanica).
White-throated fantail Fly-Catcher (Rhipidura albicollis stanleyi).
Pied Bush Chat (Saxicola caprata rossorum).
Dark-grey Bush Chat (Oreicola ferrea haringtoni).
Black-backed Forktail (Enicurus immaculatus).
Magpie Robin (Copsychus saularis saularis).
Shama (Kittocincla macroura).
Whistling Thrush (Myiophoneus temminckii eugenii).
Baya or Weaver bird (Ploceus philippinus passerinus).
Striated Weaver bird (Ploceus manyar flaviceps).
Golden Weaver bird (Plocela chrysea).
Chestnut-bellied Munia [(Munia atricapila rubroniger)?].

Spotted Munia (Uroloncha punctulata topela).
Red Munia (Amandava amandava flaviventris).
House Sparrow (Passer domesticus indicus).
Tree Sparrow (Passer montanus saturatus).
Pegu House Sparrow (Passer flaveolus).
Crested Bunting (Melophus melanicterus).
Indian Sand Martin (Riparia brevicaudata).
Wire tailed Swallow (Hirundo smithii).
Striated Swallow (Hirundo daurica striolata).
Blyth's Pipit (Anthus richardi striolatus).
Indian Pipit (Anthus richardi rufulus).
Sand Lark (Alaudula raytal raytal).
Bush Lark (Mirafra assamica microptera).
White Eye (Zosterops palpebrosa peguensis).
Yellow-backed Sunbird (Aethopyga siparaja seherioe).
Purple Sunbird (Cyrtostomus asiaticus intermedius).
Yellow breasted Sunbird (Cyrtostomus flammaxillasis flammaxillasis).
Scarlet-backed Flowerpecker (Dicoeum cruentatum ignotum).
Little Scaly-bellied green woodpecker (Picus striolatus).
Spotted breasted Woodpecker (Dryobates pectoralis pectoralis).
Pigmy Woodpecker (Iyngipicua canicapilus).
Northern Rufous Woodpecker (Micropternus brachyurus phaioceps).
Golden-backed three-toed Woodpecker (Tiga javanensis intermedia).
Great black Woodpecker (Triponax hodgsonii feddeni).
Great Chinese Barbet (Megaloema virens virens).
Lineated Barbet (Thereiceryx lineatus intermedius).
Blue-throated Barbet (Cyanops asiatica asiatica).
Crimson-breasted Barbet (Xantholoema hoemacephala indica).
Roller (Coracias bengalensis affinis).
Green Bee-Eater (Merops orientalis birmanus).
Blue-tailed Bee-Eater (Merops superciliosus javanicus).
Chestnut-headed Bee-Eater (Melittophagus erythrocephalus erythrocephalus).
Blue-bearded Bee-Eater (Nyctiornis athertoni).
Pied King-fisher (Ceryle rudis leucomelanura).
Common Indian King-fisher (Alcedo atthis bengalensis).
Three toed King-fisher (Ceyx tridactylus tridactylus).
Stork-billed King-fisher (Ramphalcyon capanses burmanica).

White-breasted King-fisher (Halcyon smyrnensis fusca).
Small Indian Pied Hornbill (Anthracoceros coronatus albirostris).
Hoopoe (Upupa epops longirostris).
White-rumped Swift (Micropus pacificus cooki).
House Swift (Micropus affinis subfurcatus).
Palm Swift (Tachornis battassiensis infurnatus).
Crested Swift (Hemiprocne coronata).
Common Night jar (Caprimulgus asiaticus).
Long-tailed Night jar (Caprimulgus macrurus bimaculatus).
Hawk Cuckoo (Hierococcyx varius).
Rufous-bellied Cuckoo (Cacomantis merulinus querulus).
Drongo Cuckoo (Surniculus lugubris dicruroides).
Pied Crested Cuckoo (Clamator jacobinus).
Red-winged crested Cuckoo (Clamator coramandus).
Koel (Endynancis scolopacaus malayana).
Green Malkoha (Rhopodytes tristis longicaudatus).
Crow Pheasant (Centropus sinensis intermedius).
Lesser Crow Pheasant (Centropus bengalensis javanensis).
Paroquet (Psittacula eupatria avensis).
Rose-ringed Paroquet (Psittacula torquata).
Blossom-headed Paroquet (Psittacula cyanocepala bengalensis).
Slaty-headed Paroquet (Psittacula schisticeps finschi).
Red-breasted Paroquet (Psittacula alexandri fasciata).
Barn Owl (Tyto alba javanica).
Short-eared Owl (Asio flammeus flammeus).
Brown Hood Owl (Strix indranee newarensis).
Brown Fish Owl (Ketupa ceylonensis).
Dusky-horn Owl (Bubo coramandus).
Scops Owl (Otus bakkamoena lempiji).
Spotted Owlet (Carine noctua pulchra).
Barred Owlet (Glaucidium cuculoides cuculoides).
Brown Hawk Owl (Ninox scutulata burmanica).
Black or Pondicherry Vulture (Trogos calvus).
White-backed Vulture (Pseudogyps bengalensis).
Tawny Eagle (Aquila rapax vindhiana).
Bonelli's Eagle (Hieraetus faciatus).
Changeable Hawk Eagle (Spizaetus cirhatus limnaetus).
Serpent Eagle (Spilornis cheela rutherfordi).
White-eyed Buzzard Eagle (Butastur teesa).
Rufous Winged Buzzard Eagle (Butastur liviventer).
Fishing Eagle (Cuncuma leucorypha).

Brahminy Kite (Haliastur indus indus).
Pariah Kite (Milvus migrans govinda (mostly migrant).
Shikra (Astur badius poliopsis).
Black Crested Baza (Lophastur leuphotes burmanica).
Laggar Falcon (Falco jugger).
White breasted Falconet (microhierax caerulescens burmanica).
Green Pigeon (Crocopus phoenicopterus viridifrons).
Pintailed Green Pigeon (Sphenocercus apicandus).
Green Imperial Pigeon (Muscaaivores aenea aenea).
Blue Rock Pigeon (Columba livia intermedia).
Rufous Turtle Dove (Streptopelia orientalis orientalis).
Spotted Dove (Streptopelia chinensis tigrina).
Ring Dove (Cenopopelia tranquebarica humilis).
Pea-Fowl (Pavo muticus).
Jungle Fowl (Gallus Gallus ferrugineus)
Barred backed Pheasant (Phasianus humiae burmanicus).
Burmese Silver Pheasant (Gennaeus lineatus lineats).
Chinese Silver Pheasant (Gennaeus nycthemerus rufipes).
Blue throated Quail (Excalfactoria Chinensis Chinensis).
Black-breasted or Rain Quail (Coturnix coromandelica).
Chinese Francolin (Francolinus chinensis).
Bustard Quail (Turnix javanica plumbipes).
Little Button Quail (Turnix dussumieri).
Burmese Button Quail (Turnix Tanki Blanfordi).
Blue Breasted Banded Rail (Hypotaenidia striata striata).
Ruddy Crake (Amaurornis fuscus bakeri).
White-breasted Water-Hen (Amaurornis phoenicura chinensis).
Moor-Hen (Gallinula chloropus parvifrons).
Water-Cock (Gallicrex cinerea).
Purple Coot (Porphyrio poliocephalus poliocephalus).
Sarus Crane (Megalornis antigone sharpii).
Stone Curlew (Burhinus oedicnemus indicus).
Stone-Plover (Esacus recurvirostris).
Large Swallow Plover (Glareola maldivarum).
Small Swallow Plover (Glareola lactea).
Bronze-winged Jacana (Metopidius indicus).
Pheasant-tailed Jacana (Hydrophasianus chirurgus).
Red-wattled Lapwing (Lobivanellus indicus atronuchalis).
Spur-winged Plover (Hoplopterus ventralis).
Stilt (Himantopus himantopus himantopus).

Painted Snipe (Rostratula bengaleusis bengalensis).
Whisker Tern (Chlidonias leucopareia Indica).
River Tern (Sterna seena).
Black-bellied Tern (Sterna melanogaster).
Little Tern (Sterna albifrons albifrons).
Skimmer (Rhyncops albicollis).
Spotted-billed Pelican (Pelecanus philippensis).
Large Cormorant (Phalacrocorax carbo sinensis).
Little Cormorant (Phalacrocorax javanicus).
Darter or Snake Bird (Anhinga melanogaster).
White Ibis (Threskiornis melanocephalus).
Davison's Black Ibis (Inocotis papillosus davisoni).
Glossy Ibis (Plegadis falcinellus falcinellus)
White-necked Stork (Dissoura episcopa episcopa).
Black-necked Stork (Xenorhynichus asiaticus asiaticus).
Adjutant (Leptoptilus dubius).
Purple Heron (Ardea purpurea manillensis).
Grey Heron (Ardea cinerea cinerea).
Large Egret (Egretta alban alban).
Small Egret (Egretta garzetta garzetta).
Little Egret (Bubulcus ibis coromandus).
Indian Pond Heron (Ardeola grayii .
Little Green Heron (Buturoides striatus javanicus).
Chinese Pond Heron (Ardeola baccha).
Night Heron (Nycticorax nycticorax nycticorax).
Yellow Bittern (Ixobrychus sinensis).
Chestnut Bittern (Ixobrychus cinnamomeus).
Black Bittern (Dupetor flavicollis flavicollis).
Comb Duck (Sarcidiornis melanota).
Cotton Teal (Nettopus coromandelianus).
Whistling Teal (Dendrocygna javanica).
Greater Whistling Teal (Dendrocygna fulva).
Spot-bill or Grey Duck (Anas poecilorhyncha haringtoni).
Little Grebe or Dabchick (Podiceps ruficollis albipennis).

List of Migrants.

Thick-billed Warbler (Phragomaticola ædon).
Radde's Bush Warbler (Herbivocula schwarzi).
Tickell's Willow Warbler (Phylloscopus affinis).
Blandford's Bush Warbler (Horonis pallidipes).
Phillippine Shrike (Lanius cristatus lucionensis).
Red Breasted Fly Catcher (Siphia parva albicilla).
Brown Fly Catcher (Alseonex latirostris).

Bush Chat (Saxicola torquata indica).
White-capped Redstart (Chaimorrornis leucocephala).
Daurian Redstart (Phoenicurus auroreus leucopterus).
Ruby Throat (Calliope calliope or pectoralis).
Blue Rock Thrush (Petrophila solitaria solitaria).
Swinhoe's Rock Thrush (Monticola gularis gularis).
Rose Finch (Carpodacus erythrinus erythrinus).
Yellow-breasted Bunting (Emberiza aureola).
Eastern Swallow (Hirundo rustica gutturalis).
Marked Wagtail (Motacilla alba personata).
Grey Wagtail (Motacilla cinerea melanope).
Forest Wagtail (Dendronothus indicus).
Tree Pipit (Anthus maculatus).
Wryneck (Iynx torquilla japonica).
Cuckoo (Cuculus canorus bakeri).
Indian Cuckoo (Cuculus micropterus micropterus).
Osprey (Pandion haliaetus haliætus).
Black-winged Kite (Elanus cœruleus cœruleus).
Pale Harrier (Circus macrurus).
Pied Harrier (Circus melanoleucus).
March Harrier (Circus aeruginosus aeruginosus).
Kestrel (Falco tinnunculus tinnunculus).
Grey-headed Lapwing (Microsarcorps cinereus).
Golden Plover (Pluvialis dominicus fulvus).
Ringed Plover (Charadrius dubius dubius).
Avocet (Recurvirostra avocetta avocetta).
Curlew (Numenius arquatus lineatus).
Black-tailed Godwit (Limosa limosa limosa).
Wood Sandpiper (Tringa glareola).
Green Sandpiper (Tringa ochropus).
Marsh Sandpiper (Tringa stagnatilis).
Spotted Red-Shank (Tringa erythropus).
Red-Shank (Tringa totanus eurhinus).
Green Shank (Tringa nebularia).
Sanderling (Crocethia alba).
Little Stint (Erolia ruficollis).
Long-toed Stint (Erolia subminuta).
Wood-Cock (Scolopax rusticola rusticola).
Wood-Snipe (Gallinago nemoricola).
Fan-tail Snipe (Gallinago gallinago gallinago).
Pin-tail Snipe (Gallinago stenura).
Jack Snipe (Lymnocryptes minima).
Black-headed Gull (Larus icthyaetus).
Painted Stork (Pseudotantalus leucocephalus leucocephalus).

Open-bill (Anastomus oscitans).
Grey Lag Goose (Anser Anser).
Bar-headed Goose (Anser indicus).
Brahminy Duck (Casarca ferruginea).
Gadwall (Chaulelasmus streperus).
Wigeon (Mareca penelope).
Common Teal (Nettion crecca crecca).
Pintail (Dafila acuta).
Garganey or Blue-winged Teal (Querquedula querquedula).
Shoveller (Spatula clypeata).
White-eyed Pochard (Nyroca rufa rufa).
Eastern White-eyed Pochard (Nyroca rufa bæri).
Tufted Pochard (Nyroca fuligula).
Golden Eye (Glaucionetta clangula clangula).

The Burmese names of some of the most common birds are given below:—

Burmese Name.		*English Name.*
Kyigan	...	House Crow.
Amiwaing	..	Hooded racket-tailed Magpie.
Wayaunghnget	...	All Laughing Thrushes.
Shwepyiso or Nyipu		Common Iora.
Butpinni or Butkalon		Red-vented Bulbul.
Butsamwè	...	Blandford's Bulbul.
Hngetpyachauk	...	Burmese Nuthatch.
Linmyiswè	...	Black Drongo.
Hngetmin	...	Scarlet Minivet.
Hngetwa	...	All Orioles.
Zayet		All Mynahs.
Thabeiklwè	...	Magpie Robin.
Sawa	...	Golden Weaver-bird.
Sagale	...	Spotted Munia.
Sa	...	House Sparrow.
Bilon	...	Bush Lark.
Pyasôk	...	Purple Sun-bird.
Thittauk	...	All Wood-peckers.
Potôk	...	Blue-throated Barbet.
Aukchin	...	Small Indian Pied Horn bill.
Bidaungbo	...	Hoopoe.
Pyanhlwa	...	Palm Swift.

Burmese Name.		*English Name.*
Bôk	...	Crow Pheasant.
Kyettuywe	...	Paroquet.
Zigwet	...	Spotted Owlet.
Linda	...	White-backed Vulture.
Wunlo	...	Tawny Eagle.
Gyothein	...	White-eyed Buzzard Eagle.
Sün	...	Pariah Kite.
Thein	...	Shikra.
Ngu	...	Green Pigeon.
Hko	...	Blue Rock Pigeon.
Gyo	...	Spotted Dove.
Daung	...	Pea Fowl.
Tawgyet	...	Jungle Fowl.
Yit	...	Burmese Silver Pheasant.
Ngôn	...	Black-breasted or Rain Quail.
Hka	...	Chinese Francolin.
Yekyet	...	Moor-hen.
Mènyo	...	Purple Coot.
Tittitu	...	Red-wattled Lapwing.
Zinyaw	...	River Tern.
Wunbo	...	Spotted-billed Pelican.
Dingyi	...	Little Cormorant.
Hkayusôk	...	Davison's Black Ibis.
Donzat	...	Adjutant.
Byaing	...	Grey Heron.
Byaingauk	...	Indian Pond Heron.
Kalagwet	...	Cotton Teal.
Sitsali	...	Whistling Teal.
Tawbè	...	Spot-bill or Grey Duck.

Flora.—The vegetation of the Mandalay Plain, rich and varied in its plant-forms, presents three distinct types of forest (1) the tall coarse grasses, interspersed with trees and shrubs, clothing the riverain of the Irrawaddy (Savannah Forest); (2) the bamboo jungle at the base of the foothills of the Shan Plateau (Bamboo Bushland Forest); (3) the sparse, mostly thorny, tree-scrub vegetation between the Savannah and the Bamboo Jungle (Thorn Forest). A carpet of short perennial grasses, consisting for the greater part of species of *padaw-myet* and growing in dense deeproot tussocks forms, though interrupted, the undergrowth throughout.

The Savannah Forest is confined to the country which is flooded by the Irrawaddy and its tributaries; grasses

such as the *kaing, kyu, yin* and *thetke* with reed-like stems bearing plumose gruiting heads, forming its most conspicuous feature. Submerged for months when the rivers are in flood, these grasses shoot up as the waters recede and, waving their silvery plumes in the sun, do much to relieve the monotony of the sands. The trees, often few and far between, in this open windswept country which is arid except when flooded, are the *ôkhnè, letpan, letkhôk, zi, pauk, mèzè,* and *ma-u*; the shrubs *kanwè* (*khanwè*), *khayan-kazaw, dangywè, kazaw, myit-kin, mè-yine*; the most common herbs *myu, baung-laung-nyo, hin-nu-nwe-su-bauk.* Much of the Savannah is under *kaing* cultivation; but extensive patches are over-run with grass or are occupied, in the depressions, by swamps. In these, a rank sub-aquatic vegetation of *wet-la, wetta-myet, wet-mye, wut-me-nyo, ye-kyetthun, shin-mwe-lun, pein* and *ôk-kha* flourishes in the dry weather months; while, added to these (mostly rushes and sedges), the *hin-nyan, kya, ye-thayetkin* and *beda-bin* enliven the *ins, kans* and back-waters with their gay and conspicuous blossoms. Submerged water-plants (*ye-hnyi*) are abundant in all the more permanent pools and swamps; but, excepting, perhaps the *myet-thi-myet*, there is, everywhere a paucity of true water grasses. A feature of some of the permanent swamps is the association of the *nabu-nwe, pein* and *hinnyan*, an association which is of much interest from the circumstances that both the *nabu-nwe* and the *hinnyan* occur as wild plants only in this sub-region of the Irrawaddy.

The Thorn Forest is the flora on the stiff, black, clay-loams that stretch beyond the silts of the Savannah and constitute the principal soils of the plain. It consists, for the greater part, of thorny trees, shrubs and herbs associated in hedgerows and copses with a variety of unarmed trees, shrubs and herbs. The commoner thorn-trees are the *htanaung, su-byu, sha, mya-sein, thi, zi, gyat-te, kauk-kwe, zaung-gyan* (Capparis); the erect thornshrubs *hnan-lon-gyine, kan, chinya-byu, leik-tha-we, shazaung-let-wa, thinbaw-nanat-kyi*; the scandent thornshrubs *me-hnan, thagyan, namani-than-hlyet, bani-hteik-wine, suyit, subôk, kinmun, kalein, sun-let-thè, chaung-gyat, zi-nwè*; the thorny herbs *khaya. hin-nu-nwe-su-bauk, le-padu, khayan-kazaw, mye-bôk-khayan,* and the spinous fruited *su-le* which is ubiquitous. The unarmed trees are the *tama, kôkko, letpan, nabè, thakhut, thanat, gyôk, thit-pagan,*

kyet-yo, taw-thidin, seik-chi, hnaw, tein-kala, hpalan bwechin, bambwe, yôn, dahat, than, than-that, leinngu zi-byu, pyinma, sit, bonmèza, yinma, egayit, hadet kyaung-sha, mèzè, sin-padi, kathit, chi, lettôk, kyi, nyaung, ye-thahpan, ka-aung-gyi, thabye, the unarmed shrubs and climbers *mayo, dangywè, kazaw, ye-thagyi, padaing, kyaungban, kyetsu, kyetsu-gyi, thinbaw-kyetsu, taw-yôn-padi, kat-sinè, wet-kyi-panè, bauk-kwe, bauk-hpyu, mè-yine, nat-cho, shazaung-let-hnyo, kinmôn, bônlôn, sa-thakhwa, thabut, kyi a-nwè, kinbut-gyi, gwe-dauk, kauk-yo-nwe, kazun-gyi, nwe-cho, kywet-nabaung, sindôn-ma-nwè, lèlu, man-thongwa, kala-myetsi, ywe-gale, migyaung-nwè, kwe-li, nabu nwè, thamaka-nwè, simi-dauk-nwè,* the herbs *ngayan-padu, ye-kazun, ye-kanyut, ye-thayetkin, hin-nyan, wet kvein, myu, kyet-mauk, hin-nu-nwè, pinsein, taw-pinsein, byauk, pwinbyu, thagya* or *hman-bin, myin khwa, se-kalôn payan nawa, kyeik-hman, sin-let-maung, taukte let-wa, taw-monhnyin, hin-gala, mya-byit, hmo-gyin, taw-pikesan, gyat-pin, thagya-ne, taw-pe, ni-hle, htikayôn-gale, mi-malaung-ban,* the more important grasses *padaw byu, padaw-nyo, padaw-ni, mye-za, myetkha, myet thi, wayôn-myet, wumbè-sa, myet-kyein, thetkè, thondin-gwa, tet-kwet, sin-ngo-myet, myet-lu, yôn-gale, thamin-mwe, myet-le-gwa, myet-walôn, myet-nôn hmwa, the-myet.* The *htanaung* and *su-byu* are often solitary. The *letpan,* leafless in the hot weather, relieves the monotony of the Plain with its large and scarlet flowers which render the tree conspicuous for miles; while the long trumpet-shaped flowers of the *thakhut,* which drop in numbers during the night, carpet the ground beneath it with white. The other trees and shrubs which, at flowering-time, lend touches of colour to the landscape are the *ngu, pyinma, bambwe, kyi, kathit, mya-sein, bani-hteik-wine, shazaunglet-wa,* and *namani-than-hlyet.* The *htanaung* and *su-byu,* planted or self-sown, are the chief shade-trees on village sites where, together with the *magyi* (always planted), *nabè, kôkko, thakhut, mya-sein, hauk-kwe, zaung-gyan* (Capparis or Boscia) and other trees and shrubs form groves. The hedgerows which, as indicated above, are a marked feature of the Mandalay Plain, traverse it at intervals between cultivation and consist of a variety of trees and shrubs. As examples of the hedgerow associations may be cited *htanaung, gyat-te* and *shazaung-let-wa* with *mo-hnan, thagyan, namani-than-hlyet,* and the thornless climbers

sindôn-ma-nwe, *kywet-nabaung*, *man-thôn-gwa*, *thabut*, *kinmôn*, *kala-myetsi*, *ywe-gale*, *kinbut-gyi*, and *kyi-a-nwè*; *tama*, *su-byu*, *gyit-te* or *hnan lôn-gyine* with *su-yit* or *su bôk*, *shazaung-let-wa*, *leik-tha-we* and the thornless *thinbaw-kyetsu*, *taw-yônpadi* and *nabu-nwè*; *chaung-gyat*, *kwe-li*, *lèlu*, or *pe-dalet* overhanging trees such as *than-that*, *kyet-yo*, *gyôk*, with *leik-tha we* and the tall grass *naya-myet*; *kauk-kwe*, *zi* or *gyat-te* or all trees with *simidauk-nwè*, *man-thôn-gwa* and *kywet-nabaung*, *shazaung-let-hnyo* with *tama*, *zi* and *leiktha-we* overhung with *kyi-a-nwè*, *taw-kazun*, *sin-dôn-ma-nwè* and other climbers. The *htan-bin* self sown and scattered, or grown *topes* like those near Kangauk and to the north of Ingyin, and the *pe-bin* which often helps to make village sites, are conspicuous features of the plain. A curious feature of this part of the district are the low solitary hills which, at intervals rise abruptly out of the plain. The more familiar of these elevations are Mandalay Hill, Yankintaung, Ngamuntaung, Sagataung and Mè-u-taung. They differ in size, form and elevation and their soils and rocks differ from those of the Plain; while, the vegetation, though thorn forest still, is of a different type from that of the plain. The principal trees are the *sha*, *dahat*, *than*, *yôn* and *thitlinda*; the shrubs *su-yit*, *chaung-gyat*, *namani-than-hlyat*, *zi*, *zi-nwè* and the thornless *zaung-gyan* (Boscia); the herbaceous vegetation being represented chiefly by the dry slender grasses *khwe-mi* and *thamin-mwe*. Bamboos, mostly *hmyin-wa*, occasionally skirt the bases of the hills, *e g.*, near Ingyin.

The Bamboo Forest is found on the reddish loams and silts lying at the foot of the Shan Hills. Here the plain is undulating and is cut up at intervals by the torrents from the hills. The vegetation consists chiefly of *hmyin-wa*, with occasional clumps of *wa-dalet* and *thana-wa*. Associated with these bamboos which grow in dense shady clumps are a variety of trees, erect and scandent shrubs and a few shade-enduring herbs like the *hpi-ka-bin*. Most of the trees and shrubs forming the Thorn Forest are, though less frequently, also met with in the bamboo Bush-land, those special to it being the teak, *kabaung*, *ze-thanbaya*, *môkso-ngayôk*, *kinbalin*, *zaung-gyan* (Boscia), *ponmathein* and *zi-nwè*. The grasses which are common here but rare in the Thorn Forest are *myet-hlan*, *naya-myet*, *myet-swè-lè* and *nga-tha-yaung* (*Tet-kwet*).

Yet another feature of the Mandalay Plain is the interruption of its surface by extensive depressions which are occupied by *ins* or permanent swamps. Of these, the better known are *kangyi-kabe*, *taunggan* and *bwet-kyi*; but, with the exception of the last-named, none of these swamps, carrying, as they do, the usual aquatics, is of any special interest from a floristic standpoint. The *bwet-kyi* swamp, situated in the north-east of the plain, is an extensive cane-brake (*kyeindaw*) in the flood area of the Thahpan *chaung*; and besides species of the rattan-palm (*kyein*) bears a forest of trees, shrubs and succulent herbs that recall the rain-forests of the Upper Irrawaddy. Of the herbs that flourish in the ooze of the swamp, the most conspicuous are *gon-min*, *hpalan-taungmwe*, *thin*, *pein*, *pein-kya*, *taw-nga-pyaw*, *ngwe-ban*, *ngayan-padu*, species of Fern (*kayukpan* and *dayingauk*), the grasses *kyu* and *thetkè*, and a variety of rushes and sedges such as *shin-mwe-lun*, *wetta-myet*, *tabaw*, *wet-kyan*, *wet-mye-u*, *wet-la*. There is no open water anywhere in the swamp, the herbs being grouped about the foot of the trees and shrubs which are often overrun with epiphytes and festooned with climbing plants. The more common trees are species of *nyaung*, *ye-thahpan*, *lettôk-gyi*, *taw-thidin*, *hpet-wun*, *ye-tama*, *thabye*, *kyi*, *mèzè*, *kadut*, *momaka*; the shrubs *sattha-hpu* and *thagyet* (often tall and palm-like), *kinbalin*, *ka-aung-gyi*, *kyet-ma-ôk*, *linda-pabyin*, *wet-kyi-panè*; the usual climbers *pauk-nwè*, *kazun-gyi*, *kalein*, *migyaung-nwè*, *nwè-cho*. The vicinity of the swamp is also well wooded, the principal tree-species here being the *sit*, *yôn*, *thit-pagan*, *chi*, *seik-chi*, *kyet-tayaw* *thit-sein*, *lein*, *thit-pôk*, *ngu*, *yinma*, *pyinma*, *sinpadi*, *nabè*, *hpalan*, *bwechin*, *kyaung-sha*, *than-that*, *zibyu*.

It is worthy of note that a considerable number of the trees, shrubs and herbs of the plain, now apparently indigenous, have been introduced from various parts of the world, chiefly India, China, and the American Tropics. These, together with the local species, now add to the richness of its flora,—a flora which, but for the irrigation and the periodic flooding of the land by the Irrawaddy, Myitngè, Chaungmagyi and other streams, might, with its low rainfall and exposed situation, have been poorer in the number and diversity of its specific forms.

CHAPTER II.

HISTORY.

Irrigation ; Sources ; Legendary History of Mandalay, and of Wetwun ; Anawrata's Forts and Pagodas ; Ngasingu ; Sawmunhla ; Alaungsithu ; Minshinsaw ; Narapatisithu ; 14th Century ; 15th Century ; 16th Century ; Madaya ; Shwepanu Thwethauk ; Win thuyè ; Pwèdainggyaw ; Taninthayi Thinnat ; Sônmyo ; Taungin : Thabyehla ; Shanpaik Letya (Maymyo) : Gwe Shans ; Amarapura ; Irrigation under the Alaungpaya Dynasty ; Mandalay ; Ploughing Festival ; Change of Capital ; Myingun and Padein Rebellions ; Diplomatic intercourse with Indian Government ; Annexation.

What is now the Mandalay District formed part of the Kingdom of Anawrata (1044-1077 A.D.), and was protected by a line of forts against incursions of Shans from the north and east. During the earlier reigns of the Pagan Dynasty the district was held firmly, and pagodas were built at the points, such as Shwezayan and Malègyi, where the invaders could be checked. Before this time, irrigation had been from hill streams ; but now tanks were dug to store the water from the hills. They were on a much smaller scale than those constructed by the Kings of the Alaungpaya Dynasty, and the bunds were formed gradually by adding to the height of the embankments of paddy fields. The river was held by posts at Singu, Ketthin and Shwegyetyet with others on the Sagaing and Shwebo side. *Mayin* paddy was of greater importance than *kaukkyi* and the folk-lore of the district centres round the inundated land, particularly that below what is now the line of the Shwetachaung, and was then the high bank of the Irrawaddy. It was this comparatively secure cultivation that was guarded by the line of forts. During the disturbed centuries which followed the end of the Pagan Dynasty the country was almost depopulated, and fresh colonies of captives and hostages were constantly settled, especially during the 16th and 17th Centuries. Local history, as evidenced by the records of 1783 A.D., goes back to this period ; it was necessary to hold the Mandalay District if Ava was to be secure. The Maymyo Subdivision was in constant dispute between the King of Burma and the *Sawbwa* of Hsipaw. With the foundation of Amarapura **Irrigation.**

in 1783 A.D. the history of the district merged with that of the capital. The tanks were repaired, both for irrigation and for protection, and a system of canals devised to supplement the hill water. More colonists were settled on the culturable plains and outlying parts were opened up. The irrigation works were kept in fairly good order until the end of Mindon's reign. After that cultivation, and with it the prosperity of the people, became precarious until the construction of the Mandalay Canal in the early years of the present century.

Sources.

For the earlier years the materials available, other than the Glass Palace Chronicle, consist of (1) inscriptions, (2) traditional histories of pagodas and shrines. There are few inscriptions of historical importance and the traditional histories have been dealt with in another chapter. The following pages give such extracts from the Chronicle, supplemented from other sources, as are likely to be of local interest. Selections are given from some of the returns for 1783 and 1802 A.D. During the last 100 years of Burmese rule the history of the district was that of the capital. Extracts from the accounts of Amarapura given by European visitors will be found in the chapter of Minor Articles; for Mandalay, full details are given in the Upper Burma Gazetteer, and in the recently published Guide to the Mandalay Palace.

Legendary history of Mandalay.

In the time of the Buddha Kaukkathan, so it is said, Mandalay was known to fame as Khinasavapura, in the time of the Buddha Gawnagon as Velamapura, and in the time of Buddha Kassapa as Padasapura. The Buddha Gautama had lived here, in previous existences as a Hunter, as the Iguana King, the Quail King, the Elephant King. When he visited the Nine Sites* he came to Htundôn-Bodet and was met by four ogres, Nga Taungbyon, Nga Taunggyin, Nga Taungmyin and Nga Taungthaman, who were filled with ardour and offered food to him and to his followers. The sister of the four ogres ***Sandamôkkhi biluma***, cut off one of her breasts and laid it as an offering before the Buddha, who foretold that in the two thousand and five hundredth year after the establishment of his Religion, Mandalay would become a great city called Ratanapura, and that the ogress would be its king.

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* Pagan, Pinya, Sagaing, Ava, Mandalay, Tagaung, Kaungtôn, Kaungsin, Ngasaunggyan.

and of Wetwun.

In 504 B.C. Thado Maharaja, King of Tagaung, sent his heir to drive out a wild boar which was ravaging the border villages. "And the heir answered and said : 'No foe in all Jambudipa can withstand me. The boar dieth ; else will I not return to my home.' And he took the five weapons in his hand and went to the place where the boar was. The boar dare not withstand a man so glorious, but fled to the Shan country of Maw, a place of forests. The heir tracked him down by his footprints, and the boar in fear of death entered a gap in the mountains. The place where he entered is still known as Wetwin." †

Anawrata's Forts and Pagoda.

The list of Anawrata's forts,‡ built as a protection against the Shans, includes twelve names which can be identified in this district, *viz.*. Ngasingu, Kunthaya, Nagamauk, Magwetaya-aung, Ok, Yenatha, Sônmyo, Madaya, Thetkègyin, Wayindôk, Taungbyôngyi, Myodin. Taungbyôngyi and Wayindôk also occcur in the story of the two brothers. To Anawrata is assigned the foundation of the Sudaungbye Pagoda at Taungbyôngyi, of the pagoda on the top of Mandalay Hill, and of the Shwegyetyet Pagoda at Amarapura Shore.

Ngasingu.

Ngasingu is said to be the place where Nga Sin, the Hunter, crossed the Irrawaddy when pursued by Kyansittha.

Sawmunhla

The foundation of the Shwezayan Pagoda is ascribed to Sawmunhla, daughter of the *Sawbwa* of Maw. †" When (Anawrata) came to Maw, the *Sawbwa*, ruler of the nine provinces of Maw, spread out reverently five golden mats. And Anawrata caused them to be stricken with the Areindama cane, insomuch that the five golden mats piled themselves one upon another in token of the King's power and glory and the King took his ease upon the mat. When the *Sawbwa* beheld it, he offered Sawmunhla his daughter, endowed with the five virtues. The King accepted her, and returned by water and land."† "Now the King kept Sawmunhla, daughter of the *Sawbwa*, ruler of the nine provinces of Maw, continually near him. And an holy relic slept in her earring and when the Queen and concubines saw that colours shone therefrom, they said to the King, 'She is a *Yogani*,' a witch ! And the King looked, and lo! the earring shone radiant with colours and he believed that she was verily a *Yogani*, a witch, as the queen and concubines had said and gave order that

† Tin and Luce, p. 83. ‡ 1044-1074.

Sawmunhla was not worthy of his golden palace, and that she must return to the city-village of her home. So Sawmunhla humbled herself and did obeisance to the King and the guardian spirit of the kingdom and the palace, and went her way with her slaves and attendants. And when she came near the site of Shwezayan Pagoda, her earring became loose and fell ; and though it was seen shining in the water, and they dived and searched and fumbled after it, they could not find nor grasp it. At last Sawmunhla looked up and lo ! the sacred relic with the earring was in the sky, revealing a miracle, for young sparrows gathered round it twittering. And she did obeisance and worshipped, and the holy relic of the earring descended and dwelt once more in her left ear. And she was minded to build a pagoda over the holy relic ; and Sakra, seeing that it would be worshipped by all people throughout the five thousand years of the religion, disclosed a heap of piled bricks, and she discovered it. Therein she enshrined the holy relic and built a cave-temple with an image five cubits in height. Now when Anawrataminzaw heard that Sawmunhla had built a pagoda, and given charity to men and monks in that place with the gold and silver she had brought from Maw, he caused royal messengers to go and see ; and if she had the portal of the cave-temple facing east towards the Shan country of Maw, they were to put her to death ; but if the mouth of the central arch faced the royal house of Pugarama, she should not die. The royal messengers arrived at dusk, and said, 'We will read and proclaim the King's command !' But Sawmunla gave them store of gifts and bribes, to the end that she might not bear the sentence till early next morning. And she fed them with good victuals in abundance, and talked to them graciously and asked them of this and of that, feelingly, that she might know the purport of the King's letter. And the messengers answered in such wise that Sawmunhla knew all the truth. Then she did obeisance and worshipped, and made a solemn vow before Sakra, the four regents of the world and the Samadeva spirits, and she fastened the golden shawl she wore, studded with emeralds, and swung it round and lo ! the Shwezayan Pagoda, which was built facing the east, had its entrance on the west. Early next morning the royal messengers saw it, and they returned to Pugarama." The Shwezayan inscription says that in 1054 A.D. Anawrata dedicated 1,000 *tas* of land in the neighbourhood of the pagoda. Sawmunhla is also credited with the building

of pagodas at Naku, Pagin, Thabyaik and Nachaik in the Maymyo Township.

Alaungsith

Alaungsithu (1112-1167) founded the Shwemalè Pagoda east of Singu, and dedicated to it a large tract of country demarcated by stone pillars. He also built the Mweandaw Pagoda at the mouth of the Myaungmyit, the Hledauk Pagoda west of Taungbyôngyi and the Inkhayu Pagoda near Thinbangôn. The Hledauk Pagoda has an inscription which was used by the compilers of the Glass Palace Chronicle to prove that Kyansittha was the son of Anawrata It records that Alaungsithu on his way to attack the Tarets repaired a *môktaw*, and that on his way back, after defeating the Tarets and killing the son of the Taret General, he built a big *ku* and *phaya* over another *môktaw*. Later he came to inspect the work and landed from a boat on the south of the *chaung*. The inscription describes the boundaries of the land dedicated for the support of the buildings, and the digging of a canal and the making of paddy land. To Alaungsithu is ascribed also the construction of the Nanda Tank, north of Mandalay Hill, then known as Maungmagan. He also dedicated land and villages to the Shwezayan Pagoda, and fifty families of slaves.

Minshinsa

Local history attains some distinctness with Minshinsaw, son of Alaungsithu by his Queen Yadanabôn. Annoyed at the favour given by his father to a lesser queen and to the son of an usher, he showed his resentment. "But the King heard it and he said 'Shall he act thus while I live? When I am dead and he is a king how will he trouble and oppress my sons and daughters, councillors and captains. He will be like a cat among a brood of chickens.' He spoke, and stripped him of his provincial revenues, his bodyguard, his estates, his gold and silver, and cast him into prison. Now his mother, Queen Yadanabôn, entreated the chief ministers and councillors and caused them to speak unto the King, that he might show mercy. Many times they besought him, and at last the King took pity and restored him all his elephants, horses and estates, but drove him out saying 'Because thou hast once shown a sullen face in my presence, abide not in my city' So the king's son Minshinsaw, took all his elephants and horses and his body-guard and dwelt at Htundôn-Bodet towards the east, founding a village and domain. There he dammed Aungbinlè Lake, three thousand *ta* in length and breadth; moreover, he dammed the lake at Tamôkso. He built three canals, creating thirty thousand *pès* of cultivated land. He ate three

crops a year, so rich was the land and fertile. Because he ordered things on this wise he filled many granaries and treasuries of gold and silver, goods and grain. Moreover, he had a great host of elephants, horses and followers. He invited certain of the noble order, scholars of Pali commentators and sub-commentators, and caused them to write many books and teach them. He succoured them with the four things needful and caused the religion to shine." * Minshinsaw is credited with the foundation of towns or "*myo*" at Htundôn, Bodetkôn and Kyaukthanbat. The two former are west of the Mandalay-Maymyo Road about six miles from Mandalay; Kyaukthanbat is a large village about three miles north of Mandalay. The Mandalay-Maymyo Road runs on top of the Aungbinlè Tank bund; the Tamôkso Tank bund carries an unmetalled cart road from Tadaingshe on the Mandalay Canal towards the Myitngê River. Minshinsaw's name is also connected with a number of small hillocks which show traces of brick fortifications such as Myothagôn and Myogyigôn in the Patheingyi Township. He is also known as the founder of the Shwekyimyin and Yadanamyisu Pagodas, and of several *kus* in the north-west corner of the outertown of Mandalay.

Narapatisithu.

Narapatisithu (1173-1210) on his way to depose his brother Naratheinka (1170-1173) came to the Shwegyetyet Pagoda. "And he made a solemn vow and said: 'If my brother shall verily be slain at the moment I spread this cloth at the pagoda in the south, may the Lord himself bow down and take it.' And when he spread the cloth, behold the Lord himself bowed down and took it."† Narapatisithu had killed his equerry, Nga Pyi, for delaying to report that Naratheinka had stolen his brother's wife. "The body of Nga Pyi, whom he had slain, floated not near nor far from the royal barge. And the Prince saw it and asked 'Whose body is it?' His ministers answered.' 'The body of Nga Pyi whom thou hast slain.' And he commanded them saying 'Bury the body at the head of yon island, and let it be worshipped by all people in this place. See that ye build a goodly spirit house." * Nga Pyi became the Myinbyushin nat (from Thudawsin, the horse on which he rode to warn his master) and his image is often seen in village shrines and the booths of *natgadaws*. The name of the place at which he was killed is given in the Chronicle as Kuttawya, which may be a variant of Kutywa, the village

* Tin and Luce, page ? .

at which the Two Brothers were tortured by Anawrata. Narapatisithu also founded the Shwedaungmyi Pagoda at Singu and placed in it one of nine images of *saga* wood; and dedicated land to the Shweyattaw Pagoda at the same place.

Minkyiswasawkè (1368-1401) gave Taungbyôngyi and Wayindôk to Saw Omma, Queen of Thadominbya (1364-68). **14th Century.**

During the troublous years of the 15th Century the places most frequently mentioned are Singu, Yenatha, Aungbinlè, Htundôn-Bodet and Wetwun-Singaung (the Maymyo Township). Ketthin, as a strong position, was of importance. In 1403 Min Mat Let Ya, joining with him Patama Mingaung (1401-1422) dedicated lands to the Ketthin *mökhtaw*. In 1403 the Bodet *thugyi* joining with him the same king, dedicated land to the *kalagyaung* which he had built on the east of Bodet. In 1406 Mingaung met Razadarit near the Shwegyetyet Pagoda and got a monk to persuade him to spare Ava. Razadarit broke up his barge and with the timber built a *zayat* there. In 1413 the Hsenwi Shans ravaged the Ava villages but Minyèkyawzwa broke them at Wetwin, himself killing their leader in single conflict on an elephant. In 1422 the Onbaung *Sawbwa* got as far as Htundôn-Bodet but was persuaded to come in and become Mingaung's vassal. Thihathu 1422-1426 on an expedition to the Delta married Shinsawbu, daughter of Razadarit. His Queen, Shinbomè, rejoined by calling in the Ônbaung *Sawbwa*. Thihathu was at Aungbinle with the ladies of the court, superintending works of irrigation. The Ônbaung *Sawbwa* hid in the jungle and in the morning attacked Thihathu from an elephant and killed him with a bow and arrows. Mohnyinthado (1427-1440) attacked and took Yenatha which held out against his rule. He also repaired the Shwezayan Pagoda and raised its height. In 1448 Thihapate dedicated land to the *kalagyaung* on the south east of Ketthin Village. He was the brother-in-law of Narapati (1443-1469) who based his resistance to an attack from Yunnan on Mandalay Hill. The invaders held all the country up to Taungbyôn, Aungbinlè, and Tamôkso and Narapati had to yield. In 1457 *Bodetmin* Anandathu dedicated land to the Nyaungwun Zetawun monastery which he had built. In the reign of Thihathura (1469-1481) Htundôn-Bodet is described as a 200 man fief. This king, also known as Pyizônmin, repaired the Yadanamyisu Pagoda and monastery at Mandalay; he dedicated villages, lands and toddy palms for their support and provided a drum **15th Century.**

with a white umbrella. He also repaired the Mandalay *Phaya thakin* in which Asoka is said to have enshrined the chin bone of the Buddha. In 1484 Dutiya Mingaung (1481-1502) and his son Mahathihathuya built the Shwemyindin Pagoda near Shwepyi in the Singu Township and dedicated land thereto.

th ntury.

In the middle of the 16th Century Singu was "eaten" by Hkônmaing, grandson of the *Sawbwa* of Ônbaung or Hsipaw. After the fall of Ava before Tabinshweti, Hkônmaing fled to Singu with his men and fortified it. Tabinshweti sent his younger brother, Thado-dhammaraza, and other leaders up the river to attack Singu. The attack was made by land and water and the place fell before a determined assault. Hkônmaing escaped, but his wife and two daughters were captured. Singu was sacked, and the Chronicle records that not a man went empty handed.

The following are translations of records found in the hands of headmen of the district.

adaya.

Nga Ngyein, *athi thugyi* of Taungbyônngè, in Kyawsin *taik* on the east side (of the Irrawaddy), born on a Friday, aged 59, examined on the 8th waxing of *Natdaw* 1145 B.E. (1783 A.D.) stated: "Madaya is said to have been founded in the reign of Ôkga Thenadhammayaza by *amat taya*, each of whom marked out 100 *pès* of land for himself. The boundaries of Madaya jurisdiction were: East, Ôkpo Hill, including Kinda *kin*; south, the Myitngè, including the new city at Htibaungga; west, the midstream of the Irrawaddy; north, Thiha jungle. In the reign of Anawrata the Powa and Myaungu weirs were constructed. Alaungsithu when he came on a progress round his kingdom repaired the weirs, canals, tanks, streams, pagodas, and ordination halls which Anawrata had constructed. My wife being the hereditary chief of Madaya, I have lived there continuously since I was twenty years of age. From the time of my wife Mi Bôn's grandmother, Mi Bôn Ti and her husband Nga Yè Gaing, through the time of my wife's mother, Ma Chin Ma and her husband Nga San Gaing, to the time of my wife herself, we have not had jurisdiction over the land within the four boundaries given above. The land over which we have had jurisdiction is bounded as follows: east, Ngakhaunggin hill range; south, a *nyaunggyat* tree in Kyaukpyôk jungle; west, Kala Hill; North, a *saunggyan* tree in midstream. We exercise the authority of *myedaing thugyi* over the people who live in the town. In 1137 B.E. (1775 A.D.) my wife died and I, her husband, took over the

administration. I have no jurisdiction over the villages which fall within the outer boundaries of Madaya; the reason for this is that Anawrata set the land apart for the support of the *nats*, and called it Kyawsin; and in the time of his successors it was outside the jurisdiction. In 726 B.E. (1364 A.D.), when Thadominbya founded Ava, he is said to have established four revenue stations with revenue collectors round Madaya Town. In 967 B.E. (1605 A.D.) during the reign of Nyaungyan *mintayagyi* at Ava, he established captives from Nyaungyan within the jurisdiction of Madaya Town, giving them land for residence and cultivation. Further, when Ava was refounded, Bodaw Sinbyushin (Thalun *mintayagyi*) collected the servants of his father, Nyaungyan *mintayagyi*, and of his brother, Anaukpetlun *mintayagyi*, and enrolled them in corps, giving them land for residence and cultivation; so that everyone had his proper share. In 1040 B.E. (1668 and 1678 A.D.), in the reigns of Pye *min* and Yamèthin *min*, when the rolls were made up for the Shwedaik, the villages within the area formerly called Kyawsin were enumerated and put under *taik sayes* and *taikôks*, and Madaya *myo* was classed as a village; so that we had no jurisdiction within the outer boundaries laid down by Anawrata and Alaungsithu."

The hereditary line of *thugyis* at Madaya is interesting. The post was held by women for five generations in succession, starting with Mi Mya Gaing, who was succeeded by her daugher, Mi Bôn Ti, her grand-daughter, Mi Chin Ma, her great-grand-daughter, Mi Bôn, and her great-great-grand-daughter, Mi No. The last-named did not wish to hold the office, and it was transferred before elders, by deed, ratified with green tea to Nga Hla, Mi Bôn Ti's grandson by a younger daughter. This Nga Hla put in the return of 1164 B.E. (1802 A.D.) and was then 47 years old. Allowing 25 years for a generation, Mi Mya Gaing was born in 1680 A.D.

The boundaries of the Madaya jurisdiction, as given in Nga Hla's return, are: east, Ngakhaunggin hill range, marching with the land of Thetkègyin; south-east, Pandaung Canal, marching with the land of Wayindôk; south, Shandaw as far as the *Pothè* (weavers) quarter, marching with Nga Ba Nyi's tract; south-west, a stone pillar on the west of a banyan tree, marching with Mi Po Si's tract; west, Kawathè (washermen) pool, marching with Nga Tha Hla's tract; north-west, a cotton tree with a kite's nest on the west of Kinmungyôn Village, marching with the end of Nga Ye Pyo's tract; north, a *zaunggyan* tree in midstream,

marching with the land of Taungbyônngè; north-east, a *nyaunggyat* tree on the east of Pe Hill, marching with the land of Taungbyônngè.

The villages of Thalunbyu, Uyindaw, Thayettaw, Minyat, Thuyèsu, Bawdi, Halin and Kinmungyôn were within these boundaries.

wepanu wethauk. Local records state that when Nyaungyan *mintayagyi* organized the resources of his kingdom in 961 B.E. (1599 A.D.) he gave 100 *pès* of cultivated land in Taungbyônngé of Madaya Township to his followers, the men of the Shwepanu *thwethauk* corps. Six *thwethauks* and the men of the Shwepanbin corps, who had surrendered at Zimmè, got land for cultivation and a site for residence; and 12 companies of Talaing hostages got land for cultivation on the south of the Madaya River, and land for residence in Taungbyônngè village. Land was also allotted out of the area dedicated to the Shwepato Pagoda. Each company consisted of 100 men who went on duty by sections of 10 at a time. A private got 5 *pès* of land, a *gaung* 7½ *pès*, and an *ahmu* 10 *pès*. There were two *gaungs* for every ten men, so the allotment per section was 75 *pès*. 750 *pés* were allotted to the *Tat thuyè* and *Win thuyè* men in the south of Madaya Township on the east of the Shwetachaung, with land for residence in Ywe and six other villages.

n thuyè. In the *Win thuyè* corps there were only 50 men to a company, serving in sections of 5 men each. Land was allotted to the men of the Pwèdainggyaw corps in the Kutywa jurisdiction in 906 B.E. (1544 A.D.) and was measured up and the boundaries described in 1163 B.E. (1801 A.D.) by the three Pwèdainggyaw *Htaungkè* and *thugyi*, the *myaungsaw* the *myedaing amat* and *saye*. In all there were found to be 271 *pès*, of which 112 *pès* had been alienated, leaving 159 *pès* for 24 members of the corps.

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inthayi nnat. The men of the Taninthayi Thinnat corps (musketeers), who were Yakhaing *kalas*, were not given land for residence and cultivation like all other *ahmudans*. As the men of the Htôn corps (Lime burners) did not work the land on the east of the Sagyin Hill by which they originally maintained themselves, orders were issued that it be given to others for their maintenance. In this way 300 *pès* were set free. The Sagaing *min* begged that they be given suitable land to make up the area necessary for their support, and orders were issued that the Einshe *min* and the Sagaing *min* should measure off suitable land which, with the 300 *pès* withdrawn from the men of the Htôn corps,

would make up the area necessary for their support. The *saye* and the *thwethaukkyis* of the Taninthayi Thinnat corps represented that they lived and served on land in Thayettaw Village within Madaya Town which had been given them for residence in the reigns of former kings, and begged that they be given land for cultivation adjoining the land on which they lived; and orders were issued that this be done. Accordingly the Einshe *min* and the Pagan *min* undertook the task of allotment on the 15th waxing of Waso 1165 B.E. (1803 A.D.) and examined the Madaya *myedaing thugyi* Nga Hla, who stated that the Shwedaik return of 1145 B.E. (1783 A.D.) showed that the men of Taninthayi *Chauk Thwethauk* had been given land for residence in Thayettaw Village on the west of the Shwetachaung in the reigns of former kings; so the bounds were beaten in order to avoid encroachment on the land of the men of the *Thuyè* corps in Aukkin and Kinmungyôn jurisdictions. On the 9th waning of *Waso* 1165 B.E. (1803 A.D.) the Taninthayi Thinnat *Thwethauks* Nga Mya Gè, Nga Tha, Pan Aung made obeisance and offerings to the *nats* who guard the forest and hills, and measured out 10 *pès* for each *Thwethaukkyi*, 7½ *pès* for each *akyat* and 5 *pès* for each man; (here follow the measurements). The total length was 112 ropes 11 *tas*, enclosing an area of 449½ *pès*; of which 75¾ *pès* had been allotted to the Sagaing *min*, the Pathein *min* and others; leaving 373¾ *pès* for Nga Mya Gè, the *thwethaukkyi*, Nga Tha, Pan Aung, Nga Ne, Nga Tha Ywè, the four *thwethauks*, and 183 men of the Taninthayi Thinnat corps. Land for residence was allotted between the mouth of the Shwetachaung on the east, and a distributary on the north, the area being 69¾ *pès* leaving 304 *pès* which was allotted equitably to the *Thinnat saye*, *thwethaukkyis*, *akyats*, and men.

The history of the Taninthayi Thinnat corps is given in the return for 1145 B.E. (1783 A.D.). In the reign of Sinbyushin (1763-76 A.D.) 500 emigrants from Taninthayi were settled at Nyaungsin in Sagaing, and subsequently transferred to Madaya. They went on service to Kyaingtôn and when they returned were enrolled in the Taninthayi Thinnat corps and given land in the neighbourhood of Madaya. They paid no revenue on such of the land as was *minmye*; but on *payamye* they paid dues to the proper authorities. They had to keep one man on duty for every ten houses; these men lived in the *wun's* house and kept watch at night in the

Anaukyôn. When the King went out in state they marched in front of the Queen's palanquin, on either side of the road carrying their muskets. The *Akyi saye* provided them with coats and hats and while on duty they got two baskets of paddy a month; also half a viss of *ngapi* and half a viss of salt.

myo. In the return for 1145 B.E. (1783 A.D.) it is stated that the jurisdiction of Sônmyo extended over the villages of Ngashwegôndaing, Mwepagan, Wettaung, Thèbôn and Shanywa. Of these Ngashwegôndaing and Mwepagan were under separate headmen, while Wettaung, Thèbôn and Shanywa were administered directly by the Sônmyo *myothugyi*. The return for 1145 B.E. (1783 A.D.) revealed a dispute over the boundary between Sônmyo and Sagyet; and as the dispute could not be settled by inspection of the records, recourse was had to trial by water. The two headmen stated in writing what they considered to be the correct boundaries of their tracts, and exchanged green tea. They were then put under water, and the Sonmyo headman, who emerged first, was declared to have lost his case, and had to pay in addition the costs of both sides. The trial took place on the 12th waxing of *Tabodwè* 1146 B.E. (1784 A.D.) When Thalun (1629-1648) organised the administration of the country, enrolled men in the Win, Koyan, Daing, Hle, Kaunghan, Thinnat and Amyauk corps, and gave them land for cultivation and residence, 3,700 men who had emigrated from Yakhaing Thantwè were given allotments at Yamèthin, Yindaw, Taungngu, Myedu and other places.

ingin. Nga Pôn Nya and 80 men were settled at Taungin in the Myitdwin jurisdiction of Ngasingu Township with permission to work the stream which feeds the Taungin and the duty of serving as artillerymen. As they had emigrated because of the great glory, merit and learning of the King they were exempted from all taxation and corvèe; their only obligation was service to the King. The return of 1783 A.D. gives the boundaries of the land allotted and records the exemption of the allottees from all the ordinary taxes and services. In 1852 A.D. it was ordered that the men of the Taungin *amyauk* and Hlesakya corps be independent of the local administration and have a hereditary right to their emoluments; and it was noted that these privileges had been confirmed to them by successive kings from Thalun onwards.

The returns of 1145 B.E. (1783 A.D.) for Thabyehla show that in this tract there were, besides that of the headman, two hereditary offices of *myedaing* and also a *myingaung*. The last was in charge of the Pauktawsa *thwethauk myinsu* which was formed in Thalun's reign (1629-1648) of men from Mogaung. All matters of criminal, revenue, and general administration, within the boundaries of the land allotted to the unit, were disposed of by the *myingaung*. Salemyin Village was given to them for residence. The family tree of the headman is of interest and is given below:— **Thabyehl**

Nga Tun San = Mi Nyein Pyo — Mi Pôn

- Nga Tun San = Mi Nyein Pyo
  - Nga Tun Pyo
    - Mi Bôn
      - Nga Hkè
- Mi Pôn
  - Nga Nyun
    - Nga Shwe U

Nga Tun San was succeeded by his son, Nga Tun Pyo, who was succeeded by his daughter, Mi Bôn; then the office went back to Maung Tun San's widow, Mi Nyein Pyo and her husband, and then to Nga Nyun the son of Mi Nyein Pyo's younger sister, Mi Pôn. By this time, presumably, Nga Hkè, Mi Bôn's son, was growing up, and he and his "uncle" Nga Shwe U, son of Nga Nyun, held the office jointly until Nga Hke, overwhelmed by his debts made over the headmanship to Nga Shwe U, who put in the return of 1145 B.E. (1783 A.D.). The lines of the two *myedaings* were reported to have failed, and the offices had been merged with those of the headman.

Ava, the royal city of gold, called Ratanapura, was handed down from one king to another; then Mohnyin *mintayagyi* enjoyed it. In the year 1438 A.D. he trapped wild Shans with a net, and brought those he had caught right to the royal city of gold, and employed them inside the palace. But they were wild Shans, and they clashed their cymbals and leaped and danced under the very eyes of the King. So he said; "You are wild Shans; you are not fit to live in the palace"; and he put them outside, and provided them with ropes and canes and iron stocks and fetters and long spears and spiked hats, and sent them to take charge of the sentry boxes and fire stations and all the police arrangements within the royal palace of gold; and bade them do his royal service without ceasing by day and **Shanpaik Letya (Maymyo**

by night. Of his royal bounty he gave them land for their support, saying "Let them be exempt from court fees, harbour dues, market and ferry tolls, requisitions, pack service, forced labour, porterage and the rest." He gave the *Shan paik* company hillsides to clear for cultivation saying: "Let them work and support themselves within these boundaries; East, the main canal; South, the Gelaung *chaung*; West, Hipani; North, the main canal" Of his royalty bounty he gave them the land in full possession, saying: "Let them be exempt from land revenue."

In 1438 A.D. Mohnyin *mintayagyi* went to the Shan States on the tour of his kingdom, captured some of the Shans who opposed him, and brought them back with him. He employed them with in the palace, but the confinement made them restless; so they danced and leaped. Because they were wild men he gave them canes and spiked hats and ordered them to join the men of the *Shan paik* and *Let ya* companies in the lines on the east of the palace and to serve with them. He gave orders; "Let my slaves be exempt from court fees, landing charges, excise duties, ferry and other tolls, uses, taxes on trade, tributes of leaves and fruit, labour, porterage, and the rest. Let them take charge of prisoners under trial. Let the men of the *Let ya asu* live where they like." In accordance with the royal order they were given allotments in the eastern country at Singaung, Wetwin, Tabyaik, Nachaik, Pyinu and Letpan. The King said "You are cultivators of hill-side" and ordered that they be given for their support land they chose between Swelegywe on the west, the Nachaik hill range on the east, Shanthe on the south and the Wetwin Shweleik stream on the north. They were to pay no revenue. The *Letya taunghmu*, *gaung*, *ahun*, and men were given exemption in perpetuity from the *wun's* demands, from court fees, landing charges, ferry and other tolls, porterage, and uses

In 1598 A.D. the Lord of Nyaungyan, when he had founded a capital at Ava, organised the 40 men of the *Let ya taungsu* under four *gaungs*, Nga Pein, Nga Kyaw, Nga Net and Nga Tôk; and gave them lines to live in. Ten of them were always to be on duty; for the other thirty he alloted land for cultivation and residence on the eastern range of hills at Nachaik, Tabyaik, Wetwun Singaung, Hngetthakyi. Those on duty were to keep guard in their lines by day and night; those not on duty were to cultivate their fields and be exempt from ferry

tolls, landing charges, and excise duties. The men of the *Let ya taungsu* were put in charge of all the police duties within the palace; executions and mutilations were carried out in the *Letmayun* prison outside. Nga Tun San, born on a Friday, aged 50, *Let ya Shan paik ahun*, examined on the 8th waxing of *Pyatho* 1145 (1783 A.D.) stated; "In the reign of Thalun *mintayagyi* (1629-1648) Nga E and 15 men from Mogaung, Nga San Wa and 15 men from Monè Nga Wi and 15 men from Zimmè, Nga E and 10 men from Kyaingthin, were enrolled in the *Shan paik daw daingsu* We 60 captives were not given land for residence and cultivation. The King ordered us to live in such villages as we liked and to serve him We found a convenient place in Tabyaik, Nakyaik, Wetwun, villages of Thônzè jurisdiction, and lived there under our leaders and served the King. The hereditary line of the *gaung* is Nga Mya Gyaw, D-na Tun, Nga Pyu (his son). The hereditary line of the *ahun* is Nga Shwe Yan, Nga Kyaw (his son) and Nga Tun San (the deponent). When Nga Pyu cannot perform the duties of *gaung* Nga Tun San performs them. Our mode of service is as stated by the *Shan paik daing gaung* Nga Paik for himself and his men"

Nga Shwe Gaing, born on a Wednesday, aged 62, *Let ya Shan paik daing gaung*, examined on the 11th waxing of *Pyatho* 1145 (1783 A.D.) stated: "In the reign of Thalun *mintayagyi* (1629-1648) Nga Tha and 15 men from Mogaung, Nga San Wa and 15 men from Monè, Nga Wi and 20 men from Zimmè, Nga E and 10 men from Kyaingthin, 60 captives in all, were enrolled in the *Shan paik daw daingsu.* These 60 captives were not given land for residence and cultivation. The King ordered them to live in such villages as they liked and to serve him. They found an agreeable place in Bangin, Wetwun West, Pyinu, Singaung, Villages of Thônzè jurisdiction and lived there and served the King. Nga Hkôn was *gaung* and was succeeded by his son Nga Aung Mya, who had no son or grandson to succeed him; so his second cousin, Nga Shwe Gaing (the deponent), grandson of his grandfather Nga Mya Gyaw's elder brother, Nga Su Bôn, and son of his father Nga Hkôn's first cousin, Nga Môn, became *gaung*. Our mode of service is as stated by the *Shan paik daing gaung*, Nga Paik.

In the middle of 18th Century people called Gwe Shans from Madaya-Ôkpo rose against the King of Ava (Mahadhammayaza-Dipati (1733-1752), and were joined by Gwe Shan

Talaings who had been settled in the neighbourhood. They resisted attacks on their position from Ngasingaing on the right bank of the Irrawaddy, sent to Pegu for help, and by a strategem got into the Burman lines and killed a large number of their opponents. When Alaungpaya organised the Burman resistance to the Talaings the Gwe Shans joined him, but he suspected them of treachery and had all those who were in Shwebo (about 700) put to death. In 1754 A.D he sent an expedition which drove the Gwe leader into the Shan States and captured his camp and followers. The name Madaya-Ôkpo seems to have applied to all the country along the south bank of the Chaungmagyi. The identity of these Gwe Shans has not been settled satisfactorily. There are several villages in the neighbourhood which preserve the word Gwe, *e.g.*, Gwedaw, Gwegyi, Gweygaung. Local tradition associates the word with Talaings rather than with Shans. Gwe Lawa and Gwe Karens are also mentioned in the Chronicles and the word Gwe probably covered any wild people living on the edge of (Burmese) civilisation. The tract was subsequently colonised by captives of war.

narapura. When Bodawpaya thought of founding a new capital it was discovered that the Buddha had prophesied that a capital would be founded within the tract of country guarded by the four ogres Nga Taungthaman, Nga Taunggyin, Nga Taungbyôn and Nga Taungmyin, who had ministered to Him when He visited these parts. In the reign of Hanthawaddy Sinbyushin, a *saya*, foretold that Htibaungga would become the capital in a century or two, and this prediction was committed to writing with a plan of Htibaungga Village and the four hills called after the four ogres. Bodawpaya sent messengers who reported that in the tract known as *Petpa* (*i e.* immediately opposite Ava) there was a fair open space within the Htibaungga village-tract guarded by the four hills of Taungthaman, Taunggyin, Taungbyôn and Taungmyin, where a city could be built having the Taungthaman Lake and the Lôktawaddy River on the south, the Tetthe-in on the north, the Aungbinlè Tank and Kyauwun Canal on the east and the Irrawaddy on the west. The meaning of the word Htibaungga has not been satisfactorily explained; it is said that the village occupied a site near Kanthitkôn and Obo. The rising ground at Taungthaman, Taungbyôn, Taungmyin is still occupied by large villages, while Taunggyin (Taunggyi) is the southern portion of Amarapura Town.

The boundaries laid down for the country parts attached to the city of Amarapura were these:—

East, the limits of the land of Aungbinle;

South, the river, marching on the east with the limits of Shwezayan jurisdiction, and on the West with the limits of the Paleik *in*, the Bawridat Pagoda, the Ngayan stream and the Hteikyet stream;

South-West, marching with the limits of Tabetswè Sheinkyaw jurisdiction;

West, a boundary mark;

North-West, marching with the limits of Minywa jurisdiction in Sagaing;

North, marching with the limits of Taungbyôn jurisdiction;

North-East, marching with the limits of Ôk Thetkegyin jurisdiction.

There were customs posts as follows:—

East on the tank *bund* to the south of Aungbinlè Village;

South, at Nyaungbinni Village:

West, at Thabyebin village;

North, at Madè village.

Irrigation under the Alaungpa Dynasty.

In 1788 A.D. Bodawpaya went into camp at Aungbinlè and set his soldiers to repair the bund of the Aungbinlè tank from the Bodaw *nat* shrine at the foot of Mandalay hill to the Sinbyushin *nat* shrine east of Aungbinlè Village and thence to Kandwin-Sèdaw Village. The sluices and the distributaries were also prepared, and the land irrigated from the tank allotted to *lamaings* under a *lamaing wun*. The tank was fed from a waterfall on the Nwala hill and from the Kyuwun Weir. In the same year he went into camp in the Thayetkan garden on the north of Thayetkan and announced his intention of repairing the Maungmagan which had been constructed by Alaungsithu of Pagan. The idea was to bund the space between Mandalay Hill and the Kalamadaung and feed the tank so formed from the Shwelaung Canal, thus making, in combination with the Aungbinlè tank, a continuous stretch of water round the capital which would add to its amenities and give it security against attacks from the east. The work was done and the tank re-named Nanda and the garden in which the King camped Nandawun. The irrigated land was allotted to *lamaings* for cultivation. In 1837 A.D. Shwebo *min* repaired the Shwetachaung Canal and the Shwelaung Weir and in 1841 A.D. he repaired the bunds

and outlets of the Nanda and Aungbinlè tanks and the Shwelaung Canal. In 1856 A.D. Mindôn repaired the bunds of the Aungbinle and Nanda Tanks and issued money to the cultivators to enable them to purchase cattle and seed. In 1862 A.D. he repaired the Shwelaung Weir, dug the Nadi Canal on the east of Mandalay City, and had gardens made along its banks. He also had the Tamôkso Tank repaired. In 1867 A.D. he repaired the distributaries of the Aungbinlè and Nanda Tanks, constructed the Atigaya Tank, and issued money for the purchase of cattle and seed.

ndalay.

The boundaries laid down for the country parts attached to Mandalay Yatanabôn *Shwemyodawgyi* were these:—

Starting from the south-east corner, which is the junction of the Thanbaya Stream with the Myitngè River on the east of the Shwezayan Pagoda, the boundary goes west along the water's edge on the right bank of the Myitngè River, with Mekkhaya *myo nè* on the far side to the south-west corner which is the junction of the Myitngè River with the Irrawaddy River; thence north along the left bank of the Irrawaddy River to the Shwegyetyet Pagoda, thence along the water's edge on the west side of Pyilonan *hlawgasa*, Yindaw, Shangale and Kôntha Islands, thence along the left bank of the Irrawaddy River to Thayethmaw, thence across the left arm of the Irrawaddy River and along the water's edge on the west side of Malaka and Alaung Islands, to Hlainggyun on the left bank of the Irrawaddy River, thence along the left bank of the Irrawaddy River to the north-west corner which is Powa North Village at the junction of the Natpauk branch of the Madaya River with the Irrawaddy River, with Ngasingu *myo nè* on the far side; thence east along the left bank of the Natpauk branch of the Madaya River, which marks the boundary between Ngasingu *myo nè* and Kyawzin *taik* to the north-east corner which is Nyaunggyaung village at the far end of Madaya *myo nè*, with the point at which four *myo nès* meet on the far side; thence south along the western foot of the hill range to the starting points.

ghing val.

The Lèhtunmingala pwè was held by the custom in fields under the Aungbinlè Tank and after the foundation of Mandalay it took place on a site east of the city on the road to Yankintaung. Starting from a point immediately west of the north end of Thayetkôn Village a square plot was marked out towards the south, containing 20 *pès*, 10 for

the King and 10 for the Queen. Bazaar stalls were erected along the road from the east gate (Uteik). The King came out in royal state with the Court and proceeded down the Nadi *chaung* to a temporary palace in the Mingala *Uyin*. Shrines were erected for the 37 *nats* near the place where the ploughing was to take place. When the auspicious moment arrived the King wearing his royal robes and regalia himself ploughed in a large field on the west side of the area marked out and was followed by the princes and ministers and members of the Court doing likewise, also in full dress, according to their precedence. The ploughs and bullocks were richly ornamented and were called gold and silver ploughs. The King then returned to his temporary palace and remained there for three days with the Court; during this period *pwès* and bands were kept going night and day and continual offerings made to the thirty seven *nats*. The King then returned to the palace. The ceremony usually took place in the latter half of *Nayôn*; the object was to obtain a good agricultural season.

Change of Capital.

Amarapura was the capital during the reigns of Bodawpaya (1782-1819), Tharrawaddy (1837-1846) and Pagan (1846-1853). Mindôn (1852-1878) moved to Mandalay in 1858, and this was the capital during the rest of his reign and that of Thibaw (1878-1885). Bodawpaya repaired and improved the Irrigation systems of the Mandalay District, held two Revenue Inquests, and built the Arakan Pagoda to house the Mahamuni image which his troops had captured in Arakan. In 1841 Tharrawaddy began to go mad and retired to an insolated palace on the Madè *chaung* where Mandalay now stands. Pagan took as his counsellors two Mahomedans who were responsible for many outrages; their names are now connected with the long bridge from Amarapura to Taungthaman. Pagan was deposed after the Second Burmese War by Mindôn.

Myingun and Padein Rebellions.

In 1866 occurred the Myingun and Padein Rebellions. The Myingun and Myingôndaing Princes considered that their uncle, the Kanaung Prince, who was *Einshemin* (heir-apparent) had ill-treated them and resolved to kill him. On the 2nd August 1866 the *Einshemin* was sitting in council with a number of ministers when the two Princes rushed into the enclosure of the temporary palace where Mindôn was staying at the foot of Mandalay Hill; they had an armed following who cut down the Myadaung *wungyi* and killed the *Einshemin* and others. The King who had heard the disturbance, returned to the palace in

the city. The two princes followed him and attempted to force open the Tagani by firing volleys at it. They were beaten off by fire from the top of the steps leading to the *Myenan* or Hall of Audience. The supporters of the *Einshemin* and of the King now collected and attacked the two princes who had retired to the Women's Court; next morning they drove them down to the shore where they seized the King's steamer and escaped down the river. Eventually they had to take refuge in British territory and were interned in Rangoon. The Padein Prince, son of *Einshemin* fled to Shwebo when his father was killed and soon collected a formidable body of men. He organized four parties one of which crossed the river at Sheinmaga and advanced through Madaya to Kabaing. Another party camped at Mingun, a third made its way to Sagaing and Ava and a fourth composed of men from Taungdwingyi, Pagan and Sale, places which had belonged to the *Einshemin* advanced as far as Paleik. The King's forces were at first driven back and the city was nearly surrounded. Mindôn wished to surrender but was persuaded to resist; arrangements for a general attack were made and were successful. The Padein Prince's men at first fought well but were everywhere defeated; the Prince was left almost alone, wandered about from place to place, and was eventually captured in Sagaing. He was kept in confinement for some months and then put to death; the British Resident obtained a reprieve, which arrived too late. The district was greatly disturbed about the time of these rebellions. Many of the villages north of Mandalay were founded by the *Einshemin* who had a large toddy palm grove near Ingyin.

[D]iplomatic [in]tercourse [wi]th Indian [Go]vernment.

After the massacre of Negrais (1759) diplomatic intercourse between the Indian Government and the King of Burma ceased until 1795, when Symes was sent to Amarapura as ambassador. His object was to establish friendly relations with Bodawpaya who since the conquest of Arakan in 1783, had been making threatening attacks on the Bengal frontier. The King and his officials were suspicious of Symes' motives, and treated all his advances with insolence. This was partly owing to French intrigue, but was doubtless more especially due to the jealousy of Portuguese half-castes, Armenians and other Asiatic merchants, who had most of the foreign trade of the country in their hands. Symes spent several months in Burma, but he failed to estimate the real character of the Burmese

people, while he overrated the government and resources of the country. His mission was a complete failure. In 1797 Cox proceeded to Amarapura; but after a five months' residence there, being unable to contend against the arrogance of the Court, he was recalled by the Indian Government. Symes was again despatched in 1802 on a second mission to Amarapura, which proved an even greater failure than the first. In 1809 Canning was sent as Agent to Rangoon and shortly afterwards was summoned by the King of his own accord to Amarapura. He was better treated than the two preceding officers, and was enabled to explain the nature of our blockade system which was then being enforced on the French Islands; but beyond that he left without producing much impression. At the conclusion of the war in 1826 Crawford was sent as an ambassador to the Court of Ava for the purpose of concluding a treaty of friendship with the King.

He concluded a short supplementary treaty, but it proved of little value. Burney was deputed as Resident at Ava in 1830, where he remained until 1837 when he withdrew. In 1838 Benson was sent as Resident at Amarapura but he was never received by the King. He returned after six months' residence leaving in charge his assistant, Macleod, who shortly afterwards withdrew also. In 1855 Phayre went on a mission to Amarapura. His object was not only to establish friendly relations with the King, but to make another attempt to conclude a definite treaty. The King refused to sign a treaty but friendly relations were established. In 1862 Phayre went to Mandalay in the hope of concluding a treaty of commerce and friendship. The Indian Government agreed to abolish the customs duty on their side of the frontier within a year; in return the Burmese Government agreed to do the same, if so inclined, within two, three or four years. British subjects were to be granted full permission to trade in any part of the Burmese kingdom and a representative of the Indian Government was to reside at Mandalay. The Burmese Government did not however fulfil their side of the agreement. At the end of 1866 Phayre again went to Mandalay but could not persuade Mindôn to forego his custom duties or monopolies. In October 1867 Fytche went to Mandalay. He concluded a treaty by which the King abolished all his monopolies excepting earth-oil, timber and precious stones. The duties on all goods and merchandise passing the frontier were reduced to a unifor

rate of 5 per cent. *ad valorem*. A Resident or Political Agent was always to be posted at Mandalay with power to decide finally suits between British subjects and in conjunction with a high Burmese official, to decide civil suits between British and Burmese subjects. A revision of this treaty was desired by the Government of India which made overtures on the subject in 1877 and 1878 but without result. Mindôn habitually evaded the spirit of the treaty without any positive infraction of the letter, and the merchants of Rangoon complained frequently and strenuously of these evasions. Several outrages were also committed on British subjects in Mandalay during the last few months of his reign. When Thibaw came to the throne the Resident, Mr. Shaw, was instructed to adopt a firm attitude and to state plainly that the Indian Government would be prepared to act for the protection of the rights of British subjects, without regard for the interests of the new Burmese Government. When Thibaw's kinsmen were massacred in February 1879 the Resident remonstrated publicly and forcibly. A breach of relations between the two Governments appeared imminent and in October

nexation. 1879 the British Resident was withdrawn. Matters drifted gradually from bad to worse, and in October 1885 an ultimatum was sent to Mandalay. The subsequent events have been frequently described. Two documents which are not generally known are printed here. They are (1) General Prendergast's proclamation at the start of his expedition and (2) the Burmese Prime Minister's letter to Prendergast, dated 25th November 1885 with the General's reply.

(1) To all Priests, Officials, Landholders, Traders and other Residents in the country of Upper Burma.

PROCLAMATION.

In consequence of the refusal of the Burmese Government to grant redress for various injuries inflicted upon British subjects and to accept the proposal made by the Viceroy and Governor-General of India for an amicable settlement of the existing difficulties, I have received orders to advance with an armed force upon Mandalay. The decision of the Government of India to send its troops into the territory of a neighbouring State has been arrived at very unwillingly and must be regarded as the result of a long continued series of provocations. The reign of His Majesty King Thibaw has been marked by the violation of

treaties, by acts of aggression on the British Frontier, by outrages upon British subjects and injustice to British traders, and an external policy systematically opposed to British interests. Misconstruing forbearance which the British Government have shown to these serious causes of complaint, His Majesty King Thibaw lately attempted to impose on a British Trading Company an arbitrary fine of ruinous amount and peremptorily refused the conciliatory offer that the matter should be submitted to an impartial enquiry. Under these circumstances the Government of India were constrained to address to His Majesty, an ultimatum demanding the acceptance of certain definite proposals for the settlement of the question and for the establishment upon a satisfactory basis of the future relations between the two countries. These proposals have been met by an evasive reply and by the simultaneous issue of an openly hostile proclamation. The forces under my orders have accordingly crossed the frontier for the purpose of exacting compliance with the demands of my Government.

Further, as it has become evident, that there can be no hope of improvement in the condition of affairs in Upper Burma so long as the present occupant of the throne remains in power, the Government of India have decided that His Majesty shall cease to reign. They have had the less hesitation in arriving at this decision from the fact, that not only has King Thibaw exercised great oppression and cruelty towards his own subjects, but his administration has been allowed to fall into such a state of disorder as to fill the country with marauders and to expose neighbouring British possessions to their inroads. It is the earnest desire of the Viceroy and Governor-General of India that bloodshed should be avoided and the peaceful inhabitants of all classes should be encouraged to pursue their usual callings, without fear of molestation.

None of you will have anything to apprehend so long as you do not oppose the passage of troops under my command. Your private rights, your religious, and national customs will be scrupulously respected and the Government of India will recognize the services of all among you, whether officials or others, who show zeal in assisting the British subordinates to preserve order

(2) "From His Excellency the Prime Minister to the Commander-in-Chief of the English War Vessels, dated 4th decrease of *Tazaungmôn* 1247 (25th November 1885).

"1. Although the treaty negotiated at Simla was not concluded, the Burmese Government were under the impression that the former friendly conditions would still prevail, and they could not, therefore, believe that the English Government would make war on Upper Burma.

"2. The Burmese Government have always had at heart the welfare and prosperity of the English people. They have all along protected the interests of the Irrawaddy Company's teak trade, and the general interests of all British subjects.

"3. We are desirous of still further protecting British interests as far as lies in our power, both at present and in all further time.

"4 The last letter (ultimatum) forwarded by the British Government contained very important political matter, and our sovereign regrets that the time allowed was too short to allow of serious deliberation.

"5. The English Government ought to have known that the only reason why the Burmese Government in their reply to the said letter did not freely concede all the demands made was because we were not allowed sufficient time for deliberation. It must have been apparent from the tenor of our reply that the Burmese Government was desirous of remaining on terms of amity and friendship.

"6. The Burmese Government did not wholly reject the rights and privileges claimed by the British Government, and we are grieved to find the English Government, which has always been so friendly, should in the present instance have made immediate war on us. We have simply resisted in order to maintain the reputation of the kingdom and the honour of the Burmese people.

"7. The English are renowned for their just and straightforward action in all matters (political). We look forward, therefore, with confidence to their doing what is just and proper in the present instance.

"8. The country of Burma is one which deserves justice and consideration. We believe that it will receive this consideration at the hands of the English Government.

"9. If this is granted, the kingdom of Burma need not be annexed. It is well to remember, too, that on a former occasion Her Most Gracious Majesty the Queen Empress was pleased to declare publicly that there was no intention on the part of the English Government to annex Burma, unless such a step was necessitated on good cause shown. As no such cause exists, the Great Powers of Europe

should not have it in their power to say that the Royal declaration has not been faithfully observed.

"10. In addition to the rights and privileges already granted in our reply to your ultimatum, His Majesty the King of Burma has now declared his will to concede all the other demands which were not at first allowed, because we had not sufficient time to bring them under our consideration.

"11. His Majesty the King is well disposed (in mind and heart), he s straightforward and just, and expects the English Government will act in accordance with the wishes expressed in this letter.

"12. By so doing the world will have no cause to say that English Government have acted unjustly, or with a disregard of the rules of international law.

"13. The English Government entered our country and attacked us with a number of war vessels. We were obliged to resist. We now desire that hostilities shall cease, and we trust the English Government will meet us half-way, and enter into a treaty by which friendly intercourse may be resumed between the two great countries."

To which the following reply was sent :—

"General Prendergast begs to inform the Kin Wun Mingyi, in reply to his letter of this date, that, acting in accordance with the instructions he has received from the Viceroy and Governor-General of India, it is quite out of his power to accept any offer or proposal which would affect the movement of the troops under his command on Mandalay.

"No armistice, therefore, can be at present granted; but if King Thebaw agrees to surrender himself, his army, and his capital to British arms, and if the European residents at Mandalay are all found uninjured in person and property, General Prendergast promises to spare the King's life and to respect his family.

"He also promises not to take further military action against Mandalay beyond occupying it with a British force, and stipulates that the matters in dispute between the countries shall be negotiated on such terms as may be dictated by the British Government.

"A reply to this communication must be sent so as to reach General Prendergast by 4 A.M. to-morrow."

CHAPTER III.

THE PEOPLE.

Population, Census of 1921, Distribution, Race, Shans, Zerbadis, Talaings, Siamese, Indians, Chinese, Kathè, Houses and Dress, Food, General Prosperity, Religion, Nat Legends, Pagoda Festivals.

ulation. The returns of the population of the Mandalay Town and of the Mandalay District (including Mandalay Town) since the Annexation have been :—

Population.

Year.	Town.	District (including Town).
1891 ...	188,815	3,75,055
1901 ...	183,816	3,66,507
1911 ...	138,299	3,40,770
1921 ...	148,917	3,56,621

The most noticeable feature in these figures is the great decrease in the population of Mandalay Town between 1901 and 1911. Sir Charles Morgan Webb in his Report on the Census 1911 explains this decrease thus :—
"The creation of Mandalay as a Burmese Capital is too recent for its population to have become rooted to the spot by the force of lengthy association. With the abolition of the Burmese Court the period of decline commenced. For a period this was masked by counteracting influences. The construction of a railway with Mandalay as its extreme northern terminus enhanced its commercial activity, while its adoption as the Military and Administrative Centre of the recently annexed territory partly compensated for the loss of the Court. It was not till the railway was extended northwards towards Myitkyina and through the Shan States to Lashio that the extent of the decline was fully manifested. Its activity as a collecting and distributing centre for the northern portions of Burma and the Shan States was greatly curtailed, and its area of commercial dominance was reduced to extremely narrow dimensions. Almost simultaneously, with the creation of a hill station at Maymyo the importance of Mandalay as a Military and

Administrative Centre rapidly decreased. Other influences have been at work. For several years plague has acted as an effectual factor in the dispersal of the population of Mandalay City. At the date of the census it was estimated that owing to this cause nearly 10,000 of its population were temporarily absent. But when a city is in a stage of decline, intentions of temporary absence are apt to result in permanent departure. Another contributory to the magnitude of the decrease was an extensive fire which destroyed over a square mile of the most populous portion of the City a few months prior to the census enumeration. And during the entire period of the operation of these adverse influences of fire, plague, and commercial and administrative readjustments there was a strong insistent demand for population to cultivate the waste areas of the province."

These causes did not however affect the population of the District outside Mandalay Town in the same way. While the population of Mandalay Town itself decreased by some 45,000, the decrease for the whole District including the Town was only some 26,000 which shows an actual increase of the rural population during this decade of some 19,000. This was probably due to the opening in 1902-03 of the Mandalay Canal which must have attracted many people from Mandalay Town.

Census of 1921.

According to the census returns the population of the Mandalay District in 1921 was 356,621 of whom 148,917 lived in Mandalay Town. If the estimate of temporary absence of 10,000 persons at the time of census was correct, the real population in 1911 was so much greater. The real increase for the town and for the whole District is therefore only 618 and 5,851 or ·9 and 1·7 *per cent.* respectively. These figures indicate considerable emigration during the past decade, for of this increase of 5,851 less than 3,000 were born within the Mandalay District. The number of males in the District is 182,999 and females 173,622. The Maymyo Township shows the largest increase—almost entirely in Maymyo itself. Amarapura and Singu Townships show small increases and Madaya and Patheingyi Townships corresponding decreases.

Distribut

Approximately half the population of the District lives in the towns of Mandalay, Maymyo, Amarapura and Myitngè. Of the remaining 336 village-tracts 29 may be said to be partially urban in character, 44 village tracts have a population of over 1,000 but most of these tracts contain more than one village.

e.

The population of the Mandalay District is composed of many races,—Burmans, Shans, Talaings, Manipuries, (Kathè) and Zerbadis, besides a number of Chinese traders and recent Indian immigrants.

ns.

The population of the Maymyo Township consists mainly of Shans and Danus (a mixture of Shan and Burman). These races are also found in villages along the foot of the hills, and the hills of the Singu Township are inhabited by mixed race of Shans and Burmans known as Kadus.

badis.

There are large Zerbadi colonies in Mandalay Town near the Arakan Pagoda, in Amyaukbôno and neighbouring villages just outside Amarapura, and in Taungin, a fishing village in the Singu Township. The majority of these are probably descendants of volunteers from India in the Burmese King's army or of prisoners captured in the Arakanese wars (like those in the Kyauksè District). They seem to have served generally as artillery-men—*amyauk-ahmudan*. In their way of life and style of house and dress they resemble their Burmese neighbours but they pay particular attention to cattle-breeding and many of them wear beards. The Amyaukbôno Zerbadis are gradually acquiring a hold over a great deal of the land in that neighbourhood. The women appear to enjoy the same measure of independence as Burmese women and to be subject to none of the restrictions usually associated with Islam.

ings.

From the times of Thalun Min (1630 A.D.) almost up to the end of the Burmese Monarchy there were continual settlements of Talaings, chiefly in Madaya Township. These were generally settlements of specially enrolled Talaing Regiments or else prisoners captured in the Talaing wars. Their Talaing origin still survives in the names of some villages such as Gwedaw, Tharrawaddy, Hmwesintalaing, Hmwehintha and Talaingngôk.

nese.

Siamese settlements of Mounted Riflemen (*myin-thinnat-ahmudan*) were founded by Bodawpaya at Thapangaing, Ôkpo, Tada-u and Zethit in the Madaya Township. There are also settlements of Siamese origin (said to have been founded by Mindôn Min but probably there was a former foundation) near the Irrawaddy bank such as Suga, U daung, and Tawbu.

ans.

Since the annexation, Mandalay, like other districts, has experienced an influx of Indians. According to the Census returns, people of Indian races in the Mandalay District numbered some 30,000, of whom about half live in Mandalay

Town and a substantial proportion of the remainder in and round Maymyo. A considerable Ghurkha population is springing up in the neighbourhood of Maymyo where some villages are composed mainly, and a few entirely, of Ghurkhas. They are mostly *ex*-soldiers or relations, children or friends of *ex*-soldiers.

In 1921 there were 2,366 Chinese in Mandalay District of whom 1,771 were in Mandalay Town. Of this total only 420 were women. The jade trade is entirely in the hands of Chinese, but the majority are occupied with broking (in beans mostly) and with liquor and pawnshops. Chinese.

Perhaps the most interesting non-Burman element in the district is the Kathè or Manipuri. These people are found in very large numbers in Amarapura and in some of the villages to the south, and form a considerable colony in Mandalay Town itself, and in some of the villages north and east of Mandalay such as Thalunbyu, Tundôn and Thinbangôn. The majority of them are probably descendants of prisoners taken in the Burmese invasions of Manipur in 1758, 1764 and 1819. These prisoners—like their decendants—were skilful in the art of weaving silk and it was principally as weavers to the Burmese King that they were kept at Mandalay and Amarapura, but they were noted also for their skill in astrology, music and dancing and massage. Their descendants—and also many more recent arrivals—have become Burmanized and the greater part describe themselves as Burman-Buddhists. The Kathè are often loosely referred to as Ponna (although they are not Brahmins). The origin and different kinds of Pônna in Burma and the proper application to them of the words Pônna, Manipuri, and Kathè is discussed at some length in Part I of the Census Report (Burma) for 1921. Kathè.

Generally speaking the houses of the people are worse in the north of the District than in the south, and in the purely agricultural villages than in those which have other resources also. The majority of the larger villages contain at least one or two wooden houses—generally including the house of the headman, but mat houses still predominate throughout the district. In the smaller and poorer villages of the plains and in the greater part of the Maymyo Subdivision the houses are very small and mean, little better than shacks. Houses Dress.

Clothes are the same as those worn in other Districts of Upper Burma. Silk *lôngyis* are very much in evidence in Mandalay Town itself but in the villages cotton clothes are

the rule—those who can afford it having one silk *lôngyi* or *paso* for the festivals and other special occasions. Some of the Zerbadi women wrap their heads up in black kerchiefs. In the villages of the Maymyo Subdivision *lôngyis* are seldom worn by men who nearly all prefer to wear Shan *baungbis*. These are always of cotton.

od. The ordinary food of the people is rice. Those who can afford it prefer *taungdeikpan* and *lônthe*—others generally eat *ngasein* or *mayin* rice. The bulk of the Mandalay paddy is probably consumed in the District but is insufficient for the requirements of the population and the deficiency is made up by imports from Kyauksè, Shwebo, Katha and Lower Burma. *Ngapi*, *ngachauk* and sesamum oil are, as usual, important articles of diet. In the riverine villages vegetables are used as an addition to the meal and in some parts of Maymyo Township form the staple food. Betel is grown fairly extensively round Madaya.

neral osperity. In the reign of Mindôn Min, which for Mandalay and its neighbourhood, is the golden age of the Burmese Monarchy, the district seems to have been fairly prosperous. Food is said to have been plentiful and cheap and life moderately secure. But after Mindôn Min's death, the district suffered heavily from the anarchy which in Thibaw's reign spread so rapidly all over the country and from the disorders of the annexation period. In 1889, Mr. Gibson in his original settlement report noted that "owing to the dacoits and consequent desertion of villages, some 6,000 acres of land have turned into high grass jungle." In 1893 Mr. Laurie wrote:— "The opinions expressed by Burmans on this question have to be taken with a reservation. It would be unwise in a Burman to produce an impression that he was well-off as his experience under the Burmese régime has told him that such an admission is a sure provocation of extortion. Illegal taxation by *wuns* and other Burmese officials seems to have been formerly practised to a considerable extent, and the agriculturist held in far greater dread the casual visits of these officials than the taxation levied legally through the village headman. The long established and under King Thibaw almost respectable institution of dacoity was not feared so greatly because a village could buy off a gang of dacoits on reasonable terms. . . A revolution has taken place in public opinion since the annexation. . . Repressive measures have altered the status of the dacoit, who is now regarded, in

this district at any rate, as belonging to the lowest class of criminals. Periods of drought have happened before within the memory of men still living, but there has never been a period when property and life were so secure. The fact is thoroughly and gratefully appreciated by Burmans. It is at the same time impossible not to notice the fact that the succession of dry years since 1887 is more or less associated with and attributed to the entrance of a non-Buddhist power." Even now in several places in the Maymyo Subdivision the abandonment of paddy cultivation or at least of yearly cultivation was attributed to the deterioration of the rainfall since the annexation.

From 1903-06 Mr. Gibson was again engaged on Settlement operations in the district and found that in the Mandalay Canal Tract agriculturists, on the whole, could not be said to be in good circumstances and that non-agriculturists, mostly residents of Madaya Town and the villages along the Shwetachaung Canal, were as a rule well-off, especially paddy traders.

In the rest of the district he found that the condition of the pure agriculturist had decidedly improved,—he was better housed, better clothed, and even more blatantly discontented. Of the non-agricultural classes he remarks that fishery lessees are the wealthiest, and the weavers of Amarapura and garden-caretakers of Madaya the poorest.

In 1892 conditions were still abnormal and a marked improvement was bound to occur in the first decade of settled government. But it can hardly be said that prosperity has continued to advance at anything like the same rate since the begining of the century. The opening of the Mandalay Canal has, of course, effected some improvement in the tract which it serves, but neither in that tract nor elsewhere in the district does the condition of the villages or the appearence of the people show any marked indication of prosperity. The weavers of Amarapura are still very poor but the industry appears now to be on the road to recovery and it is to be hoped that the introduction of the improved loom will gradually increase their prosperity. In the Singu and Madaya Townships and in some-other portions of the district, particularly along the foot of the hills, the prevalence of malaria retards or prevents any improvement in the conditions of the people. Only in the Maymyo Township does there seem to have been any real increase in prosperity due to the improvement of communications and the demand for fresh

vegetables owing to the growth of Maymyo Town. But the district as a whole cannot be said to enjoy any marked or certain prosperity. Mandalay itself is a declining City and throughout the district the only real improvement in the condition of the people since the original Settlements in 1889 and 1892 lies in the greater security of person and property and the improvement of communications.

Religions. According to the Census of 1921, 84 *per cent.* of the population of the Mandalay District were Buddhists, 6·4 *per cent.* Mahomedans principally Zerbadis and 6·2 *per cent.* Hindus. Christians numbered 8,329 and Animists 2,698.

...l legends. Although Buddhism is the avowed religion of the people, Nat worship is still deeply rooted and counts for much in the lives at least of the country folk. Of the *nats* who are worshipped in the Mandalay District none are more famous than the Brother Nats of Taungbyôn. The best account of their origin and exploits is given in the Glass Palace Chronicle thus—

"At that time two Kala brothers were shipwrecked near Thatôn, and they rode a plank and reached Thatôn. And they went into the presence of the chaplain of the Thatôn King and attached themselves to him. And the monk loved and regarded them and kept them continually near him. One day he called the young Kala brothers and went to dig herbs for medicine in the forest. When he entered the forest he found a fakir, possessed of mystic wisdom, dead with the marks of violence upon him. Now the monk, chaplain of the Thatôn King, was a perfect scholar of the Pitakas, Vedas, medicine and charms, and seeing the dead body of the fakir, he said: If a man were to roast, fry, stew, or seethe the dead body of this fakir and eat it, he would lose all manner of diseases, and his life and all his elements would last for ever. A ten days journey he could go in a day. He could bear the weight of a thousand (viss). He could even seize a full-grown male elephant by the tusk and fell him. Or again, if we acted not on this wise, but if we steeped this dead body of the fakir in medicine, our life would last long, and ye and I, leaning on the virtues of the fakir, would get many benefits. Therefore, ye twain, shoulder me the dead body. When we reach the monastery I will collect medicine and see to it. So the Kala brothers shouldered the dead body of the fakir and carried it. Now this is the nature of fakir's dead bodies. Lifeless, they are said to be about the size

of a natural seven months' babe. And because they eat only *Abbhantara* mangoes and rose-apple fruits, their fragrance is great, like that of *nathabu* plantains. When they reached the monastery they stored up the body with care. One day when the chaplain of the Thatôn King had gone to the palace, the young Kala brothers roasted, fried and ate the fakir's dead body. When they had eaten it they said; Let us test whether what our teacher told us be true or no! So they made assay, and lo! they could lift a stone slab ten cubits in length, eight cubits in breadth, and they put it at the foot of the stairs of the monastery. And when the chaplain of the Thatôn King returned from the palace and saw the stone slab, he questioned them, for he divined that they must needs have roasted, fried and eaten the dead body of the fakir, and so lifted the stone slab and put it there. And the Kala brothers confessed that they had verily eaten it. And the chaplain of the Thatôn King abode in silence. From that day forward the young Kala brothers had the strength of a full-grown male elephant. After a long while the Thatôn King grew sore afraid of them and sought to lay hands on them. He seized and killed the elder brother while he was asleep in his wife's house. But the younger brother fled from the kingdom of Thatôn, and coming to Pugarama attended on Anawrahtaminsaw. And Anawrahtaminsaw seeing the looks and bearing of the Kala, took pity on him and kept him continually near him. When the Kala was killed, the King of Thatôn asked the chaplain what should be done with him. And he said "cut up the body of the young Kala and bury the right hand in such a place. Bury likewise the left hand, the right thigh, and the left thigh, the head, the intestines and the liver, in such and such places. If this be ordered with divers charms and ceremonies, this city of Thatôn, though it be assaulted by all manner of foes, cannot be conquered! So the King of Thatôn did so, and buried them with manifold and divers charms and rites and ceremonies. From that day forward no enemy could daunt nor frighten the kingdom of Thatôn. Now Anawrahtaminsaw sent the young Kala who had come to him, ten times a day to Poppa to fetch *saga* flowers. Such power had he, it is said. One day an ogress* at Poppa, seeing the young Kala, lusted after him, for they were brought together by *karma* done in their past lives.

* Known as Mè Wunna.

She took upon her the form of a woman and lay with the young Kala, and two sons were born. When they grew up she presented them to Anawrahtaminsaw, and he seeing their looks and bearing, kept them near him, and called them Shwepyingyi and Shwepyinngè*. Anawratha attacked Thatôn. When Manuha, King of Thatôn, heard that Anawrahtaminsaw had marched forth with an innumerable host with his four generals and demon horses, he was sore afraid and shut the city gates and prepared to meet him by fortifying the city. So when the king's army arrived by water and land the four generals went foremost up to the walls, but they could not enter. Though they made many assaults they were not victorious, because of the charms which had been devised. Anawrahtaminsaw questioned his masters of white magic and black, saying 'What meaneth this?' and they answered. 'He winneth the victory because he hath devised many charms at Thatôn;' Then spake the Kala foot-runner: 'Mine elder brother was put to death long ago and buried with divers rites and charms. Thou canst not well win victory until thou hast taken and destroyed his head and hands and thighs.' So Anawrahtaminsaw sent and commanded him, saying 'Bring them from their place of burial;' And the Kala foot-runner entered the city by night and questioned his brother's wife until he knew the spot where his brother's thighs and hands were buried, and when he knew it, he brought them from their place of burial and offered them to the King. And Anawrahtaminsaw questioned yet again his masters of white magic and black, saying, 'What must I do with them?' And they answered, 'It were best only to drop the head and hands and thighs of the young Kala into the sea.' Even as they had spoken, he put the bones upon the royal barge and dropped them into the sea. It is said that when they fell a column of water sprang up to the height of a young palm tree. Not until all these preparations were made could the royal host of fighting men enter Thatôn." †Anawrahta went to China to ask for the sacred tooth; summoning thereto the four riders on demon horses and the Shwehpyi brothers. But the Emperor took no notice of him. Anawrahtaminsaw said: 'The Utibwa regarded me not. He cometh not forth to offer gifts when such a king as I hath come; Must it be ever so?' And he

* Tin and Luce, pages 75 and 77.
† Tin and Luce, pages 77 and 78.

called the Shwehpyi brothers and commanded them, saying 'Enter this night to Utibwa's palace. He sleepeth guarded by a wheel, an engine worked by water. Suck out all the water with a tube, and mark three lines with lime upon the Utibwa's body. And why? He regardeth me not, neither cometh he forth to offer gifts when such a King as I hath come! Must it be ever so?' If it is any longer I will cut him asunder along the lines marked by the lime. Leave ye this message in writing up on the wall! And the Shwehpyi brothers hearkened to his word, and entered by night and sucked up the water and marked three lines upon the *Utibwa's* body and left writing up on the wall"*. Anawrahta failed to get the sacred tooth, and returned. Now when he came to Kyawzin, he put to death at Wayindot the Shwehpyi brothers, for he trusted them not. The spot where they were killed is still known as Kupya banyan tree. And Anawrahtaminsaw built a *gu* at Taungbyôn that the religion might last five thousand years for the benefit of all beings, and he called it Hsutaungpyi. Thence he returned on board the royal raft. Now the Shwehpyi brothers had become evil spirits, and as the royal raft floated down they kept catching the rudder so that it could not move. Therefore he questioned his masters of white magic and black, and they spake into his ear, saying 'Thy servants, the Nga Hpyi brothers, did thee faithful service, O King, but it booted them not, and now they haunt thee, catching hold of the rudder!' So Anawrahtaminsaw ordered the building of the spirit palace at the Hsutaungpyi pagoda, his work of merit at the village of Taungbyôn, and that it be worshipped by the people living throughout the length of Kyawzin. And his ministers did as the King commanded them".†

The account given by Mr. Gibson in his 1888-89 Settlement Report differs on some points from the one in the Glass Palace Chronicle. The Kala brothers are said to have reached Thatôn on a large wooden tray (*byat*); hence their names Byatti and Byatta. Byatta the younger, on the day that his children were born, returned late to the palace with his flowers. More as an excuse for ridding himself of so powerful a man than as a punishment for such a trivial fault the King ordered Byatta to be executed. Just before the sentence was carried out, Byatta informed the king of the birth of the children, and, as a last request,

* Tin and Luce, pages 80 and 81.
† Tin and Luce, pages 83 and 84.

begged of the king to adopt them, because like their father they would prove *Lusungaungs* (gifted with extraordinary abilities). The mother, being aware of what had come to pass, placed the twins in two jars (pyino) and threw them into the river, the current of which carried them to Pagan. Here they were discovered by the King, who took charge of them and gave them the names of Shwepyingyi and Shwepyinngè. The Emperor of China is said to have presented Anawrahta with some virgins. On his return the king of Burma built the Sudaungbye Pagoda at Taungbyôn.

By this time the rest of the King's followers were growing envious of the Shwepyin brothers, and they soon found an opportunity of bringing them under the royal displeasure. For the building of the Sudaungbye Pagoda every one of the King's retinue had to contribute his share of labour, and the enemies of the twin brothers contrived to leave a portion of the inner wall incomplete for the want of two bricks; this they alleged was due to the neglect of the twin brothers. Furious at this disobedience of his commands the King ordered their immediate execution. On this the two brothers made themselves invisible, appearing only at intervals. But being at heart loyal subjects they eventually surrendered themselves, and though the King would not forgive them, he could not forget his former affection for them and directed that they should be executed at a distance from him. As their death could not be compassed by ordinary means they were taken to a village where *thayelun* (leather rope) was demanded for their execution (hence the village called Lundaung). They could not however be killed with this and were sent to another place, where *wayindôk* (stick made with male bamboo, hence the name of the village Wayindôk) was asked for and the result was attended with similar failure. Seeing that the king was determined that they should die, the brothers themselves informed their executioners that if they were taken to a certain spot and a certain mode of torture called *kutnyat* used they would surely die. This was accordingly done, and since then the place bears the name of Kutywa.

At the Sudaungbye Pagoda are to be seen to this day large stones with which it is said the twin brothers used to play, stocks in which they were placed, and a small cell in which they underwent torture, and the floor of which is stained with blood.

With regard to the building of the "spirit palace" at Taungbyôn Mr. Gibson says "(The King) placed as caretaker one of the maids presented by the Emperor of China. This appointment is hereditary from mother to daughter, and the woman who now has charge of the place claims to be lineal descendant of the first one who held that office. The king also dedicated to the *nats* three *pès* of paddy land, the produce of which is annually distributed in charity by the "Nandein" (caretaker of the palace) when the great feast of August takes place.*

The present *nat-ôk* and *nandein* (supervisor of the *natkadaws* and guardian of the shrine) give a different version.

When Alaungsithu was returning from an expedition to China the two brothers clung to the rudder of his barge. When questioned they explained that they were the servants of his grandfather Anawrata and that they wished Alaungsithu to give them land, guardians and attendants; so Alaungsithu gave them two maidens, natives of Nam Sam, whom the Emperor of China had presented to him. Their names were Kyamaing Kun and Kyamaing San, and they were made guardians of the shrine and given land for their support. Those who lived throughout the length of Kyawzin were appointed servants of the two brothers; some were to watch the images, some were to offer food, and some to carry the palanquin. The limits of Kyawzin were set as, east the lofty range of hills, south the Dôktawaddy-Myitngè river, west the Irrawaddy river, north the Yenatha river (the Chaungmagyi).

There are three annual festivals at the shrine of the two Brothers at Taungbyôn. The first is held on the 12th and 13th waxing of Tabaung. On the first day the hereditary servants of the Two Brothers make obeisance to the *Nats*; on the second day the images are bathed in a *sayat* on the west of the shrine. The second is held on the full moon day of Nadaw. The wives of the *nats* dance, accompanied by a band, holding swords and spears in their hands to celebrate the departure of the Two Brothers for war. Both these are minor festivals and are only attended by the local residents and persons connected with the service of the Two Brothers. The third festival is of more than local fame and is attended by people from all parts of the province.

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* Report on the Settlement of the Mandalay District, page 89, paragraph 42.

The main festival begins on the 10th waxing of Wagaung, at the same time as the festival of the Taungbyôn Sudaungbye Pagoda. The hereditary servants of the Two Brothers come to the shrine and make obeisance with offerings of coconuts and plantains; those whose service is on the water join together three boats and make a raft ready for the Bathing Ceremony.

On the 11th waxing the attendants of the Two Brothers carry the images out by the west door of the shrine and put them on a palanquin; the servants whose duty it is to carry the palanquin then bear them away in a royal procession to the raft at the landing place on the west of the Shwetachaung. Boats manned by water servants come from Nyaunggôn, Sinywa, Suga, Sinywagale, Ywathit, Udaung, Pyawbwè and Wingyan and drag the barge by means of a long rope to the Natthitpin in the Kyi-hse-hna-in on the west of Nyaunggôn village. The boats take it in turn to drag the barge, and the rowers sing meantime, while others dance. Arrived at the Natthitpin the images are undressed and bathed by pouring Irrawaddy water over them, or if the river is high by dipping them in the river. Then they are redressed and dragged back to Taungbyôn in the same way that they were dragged out. As they carry the images from the Shwetachaung *bund* to the shrine the palanquin bearers snatch meat and drink from the stalls along the way. While the images are on their way to and from the Natthitpin no music is played in the village, but it breaks out after their return. On the 12th Kathès and Zerbadis make offerings of rice and *ghi* and make their vows in their own fashion. They also split coconuts with a *dah*. The *natkadaws* and *natwins* of the 37 Nats make offerings of coconuts and plantains.

From the 13th waxing onwards people from throughout the length of Kyawzin offer yellow and white flowers and food to the images. On the 14th waxing is performed the Hare ceremony. "The carcasses of two hares are carried in procession round the village to the accompaniment of music and dancing, shown to the image of Bodaw at his shrine and then offered to the Twins (*i.e.*, to the Two Brothers). The main entrance to the Brothers abode is roped off before this to prevent the vulgar herd from using it. The hares are carried by wives of the Bodaw *nat* selected by the *natters* or keeper of the Bodaw shrine. On arrival at the "palace" (*i.e.*, the shrine of the Two Brothers) the hares are made over to the hereditary male

yônsets, persons so named because it is their duty to offer them to the images."* On the same day a *teinbin* is set up on the north of the shrine and cut without ceremony. This tree is connected with the Younger Brother.

On the 15th waxing the *nat-ôk* comes out of the west door of the shrine and goes straight to a place where a *teinbin* has been planted in front of the shrine. He invokes the Elder Brother, and when he has become possessed, he faces the Sudaungbye Pagoda and makes his vows. At this moment messengers sent by the Burmese king used to propound questions to the *nat-ôk, e.g.*, would the rains be good or not, and write down his answers. Then the *nat-ôk* cuts the *teinbin* with a *dashe* and the crowd scramble for the fragments, believing that they will make them successful in their cultivation or business. Two large branches are obtained from the forest, drenched with water, and planted one in front of the shrine, on the west side, to represent the elder brother, and one on the north side to represent the younger. The tree on the north is cut first, by the keeper of the younger brother's image; and then the tree on the west, by the *nat-ôk* himself, dressed in a military officer's uniform as worn under the Burmese King. Plantains are first thrown as far as possible to the four points of the compass; water is poured in a complete circle round the tree; rice is cast to the four quarters, and over the people; and a performance follows which is called the dance of the Seven Great *Nats* * * * The dancers include the four hereditary priestesses and a man representing the Mahagiri *nat*. In the intervals between the last dances the performers walk round the tree three times, returning twice for each dance. The last procession round the tree becomes a kind of sword dance. The four priestesses, who carry swords throughout, lay them on the ground two by two parallel to each other, the points, together and repeat the action alternately in opposite directions, finally the headpriestess seizes the top of the tree in her left hand and with her right severs a branch with her sword. Instantly the crowd falls on the tree and tears it to pieces. The fragments are highly prized, and are planted in the field to bring a good harvest."*

The following is a translation of the Songs of the two Brothers which is sung while the tree-cutting ceremony takes place. The translation has been made from the *Thônsè kuhnit min nat sa dan.*

* Grant Brown; The Taungbyôn Festival.

The chant of the *Shwepyin Naungdaw* (elder brother); "We two brothers are decked with smooth black jackets embroidered in various colours, red loin-cloths, red turbans and sashes. We were the servants of King Nawrata and we bore naked swords on our shoulders Our father was a diligent servant of King Nawrata. Five times he went to Popa Hill and thence returned with flowers before the King had combed his hair. On one occasion our father met with a *Biluma* on Popa Hill and fell in love with her; and by her he begat two sons, we two brothers. On our births, the gods poured down blessings. I am known as Shwepyingyi. When the king went to China to obtain the holy tooth relic, we two brothers succeeded in bringing Udibwa to his presence. On his return to Pagan the king ordered a pagoda to be built at Taungbyôn by all the persons of his court. We two brothers omitted to carry out his orders and did not put in the two bricks, which were the share of work allotted to us, and we were put to death. Ye servants of the King please think of the two brothers with sorrow."

The chant of the Shwepyin Nyidaw:

"I am the younger brother of Shwepyin Naungdaw, the chief *nat* of Taungbyôn. Our dress is alike. I served the King of Pagan to his satisfaction and brought him flowers in the same way as my elder brother did. I was called the younger Shwepyin. During the expedition to China, we two brothers destroyed within one night the machinery put up by the Sawbwa for his protection, entered his chamber, wrote a message for him on a railing to the north of the machinery and drew lines on him with lime to frighten him. Thus did we serve the King at the risk of our lives; but he slew us because he found not the two bricks, the share of work allotted to us. On our deaths we became *nats*; but getting no favour whatever at the hands of the King, we clung to his golden barge and stayed its progress. Then the King granted to us all the country round Taungbyôn. Ye maidens love ye us who wear golden hats."

Mr. J. A. Stewart, in a note on the festival, says: * The Brothers have a number of permanent attendants, who derive their income from the contributions at the festival. Besides these there are subordinate officers, such as the bearers of the *nats'* palanquin, who regularly attend

* Ridgeway: Dramas and Dramatic Dances, pp: 392, 393.

the festival. All these posts are hereditary. In the case of the permanent attendants at any rate, I believe that succession to the emoluments and obligations is through the mother, in the female line. I did not however enquire closely into this. The principal attraction of the festival is the dancing and frenzy of the *nat-kadaws* or wives of the *nats*. Shwepyingyi is a respectable *Nat* (Nat-thu-daw-gaung) and has few wives. His brother has many, probably some hundreds, and marries more every year. The phrase is *maya kauk thi*, which literally means "to gather or pick up a wife." Many of these *natkadaws* are married women. Some are of fairly good position; for example, wives of traders, or belonging to the families of Subordinate Government officials. Most are women of low class. I heard a Burman remark how rare it was for either of the *nats* to pick up a woman at all good looking. The *natkadaws* do not seem to belong exclusively to Shwepyingyi and Shwepyinngé among *nats*. They may induce possession by other *nats* as well. The usual method is to sit down in a reverent attitude, the eyes closed or fixed and staring; the lips move as in prayer, or a song is sung lamenting the misfortunes of the *nat* while in life. The body begins to rock about: presently the *nat-kadaw* may leap up from the ground and throw herself down again. After this has gone on for some time she begins to adopt the demeanour and the voice of a man. This is a sign that the *nat* has entered. Her talk is usually pointless, and often coarse. People ask her questions about the life of the *nat* and about the future fortunes of themselves or their friends. She answers or ignores these according to the degree of her frenzy, or perhaps of the difficulty of the questions. I imagine that all the *nat-kadaws* are subjected to such questioning. I myself should have been afraid to attract their attention to myself, but Burmans appear to be contemptuous of them, even while believing in their inspiration. One *nat-kadaw* I saw dance was supposed to be possessd by a Shan *nat*, and spoke Burmese with a Shan accent. It was noticeable that this accent wore off gradually. They dress as men or at the moment of possession make certain changes in the method of wearing the clothes so as to resemble men. In deference to the religion of the two brothers, it used to be the custom to refrain from eating pig's flesh at the festival. The *salaam*, too, is a mark of respect to the *nats* as Mahomedans."

It may be of interest to describe the great *wagaung* festival as it was observed this year (1925) though it is to be regretted that it is not now celebrated with all the solemn and gorgeous ritual which must once have characterized it. On the 10th waxing of *wagaung* all the retinue of the Two Brothers, the *Natôk*, the two *Nan deins*, the *Nat wins*, the *Nat-sayes* and the *Nat-gadaws* together with all the other hereditary servants of the *Nats*, musicians and such like, assemble at dusk at the temple and announce their presence. This gathering is to make all necessary arrangements and assign their respective duties to the servants of the *nats*. On this night too all the other 35 Nats are invoked to the accompaniment of Burmese music.

On the next day (the 11th waxing) the great event is the ceremony of washing the images in the Irrawaddy river. But before the procession starts from the temple the two *achawdaws* (အချော့တော်) *i.e.* coaxers or flatterers —sing coaxing songs and fan the *nats*. Then the two *achidaws* (အချီတော်) *i. e.* bearers lift up the images and put them in their golden palanquin. Small bits of red cloth are distributed to the palanquin bearers who place them in the lobe of their ear. The procession then sets out in the following order, first the band, then the *thaing* and *kyaing* bearers, then the *dah* bearers. The *dahs* are covered with gold and are carried sheathed and held over the shoulder and near the top are tied with bunches of brightly coloured kerchiefs. The bearers have their *pasos* looped up to show knickers of green or purple fringed with gold such as are worn by the *mintha* in the *pwè*. Like all the other servants these bearers are hereditary and this year one of them was a girl, there being no man available. After the *dah* bearers comes the palanquin in which the *achowdaws* ride with the images and on the right and left of it the umbrella bearers with open umbrellas, then the two *nandeins* and the *nat-ôk* and the eight *nat gadaws* four for each brother—dressed in what is supposed to be Persian fashion and wearing a quaint headdress with the four corners turned up and adorned with flowers. These "queens" are followed by the maids of honour, whose number is apparently unlimited bearing on their heads gold boxes which contain the *nats'* new clothes and the golden cups or basins used in the bathing ceremony. The chief queens are selected by the *Nat-ôk* and the *nandeins* from among the maids of honour when a vacancy is caused by death. At the water's edge the

nats in their palanquin accompanied by all concerned in the ceremony are embarked on a barge and towed out to the *nat-thit-pin* between the villages of North and South Nyaungôn. But should there be a funeral in either of these villages on that day the washing takes place elsewhere. Hundreds of people in other boats escort them out with music and dancing and racing boats from villages on the banks and islands of the river dash up and down apparently displaying their prowess. A picturesque touch is given to the crowd at this ceremony and indeed throughout the festival by garlands of greenery gathered at Mè U or *Thakinma* hill—where Mè U is the guardian spirit—with which many adorn their heads. This Mè U or Mè Shwe U was a girl with whom the brothers fell in love. But she spurned their love and in revenge they caused her to be eaten by a tiger. Thereupon she became a *nat* and she has also a shrine at Taungbyôn. She is generally depicted as working at her loom while the tiger advances on her from behind. Arrived at the *Natthitpin* the *nats* are divested of their clothes and water from the Irrawaddy is poured over them. When the river is in high flood the images are put into the water instead of merely having water poured over them. After the washing is completed the faithful sprinkle the images with scent—one pious devotee added a somewhat anachronistic touch by anointing their heads with brilliantine. The *nats* are now robed in their new clothes, their crowns are put back on their heads and their *dahs* in their hands and they are escorted back to their palace. Before entering the temple the bearers make the stall-keepers near the entrance give them presents of money. Then the procession goes round the Sudaungbye Pagoda and on the east side all bow down thrice and leave by the Southern entrance of the pagoda compound. In front of the temple the procession again faces the pagoda and bows thrice and then the images are enthroned in their shrine.

The second and third days of the festival (12th and 13th waxing) are quiet and devoted to making offerings to the *nats*. In the case of offerings of fruit and flowers three special methods are observed: (1) *Pyapwè* (ပြပွဲ) when the offerings are merely raised above the head before the images and then taken back; (ii) *Wetpwè* (ဝက်ပွဲ) where half is taken by the *Nandein* and the other half by the offerer; and (iii) *Htatpwè* (ထပ်ပွဲ) where the *Nandein* has to add a gift equal in kind or value and return

it to the offerer. Other presents—particularly money, clothes etc., are all kept by the *Nandeins* for their own use. The *Nandeins* also enjoy the produce of the paddy fields consecrated to the *nat* by King Anawrata for the benefit of the shrine.

On the 14th waxing takes place the ceremony of the Hare Dance which has been described above. There are many legends to account for this rite. The most generally accepted one records how on their annual visit to their mother at Mt. Poppa, as they rested in the Amarapura Township the brothers were entertained by an old man with toddy and fried hare and in gratitude rewarded him with pots of silver. After the Brothers became *nats*, the old man every year visited their shrines at Taungbyôn and made offerings of hares. But one year he failed to carry them his offering and his life was straightway taken from him by the wrathful *nats*. But before he died he enjoined his children not to fail in paying the yearly visit to the shrine of the Brothers at Taungbyôn with offerings of hares lest a similar fate overtake them. In the evening there is a rehearsal of the tree cutting carried out with little ceremony.

On the Full Moon day in the morning offerings are made to the pagoda and the *pôngyis* out of the presents received by the *Nandeins* on behalf of the brothers; and in the evening there takes place the ceremony of the cutting of the *tein* tree which is the culminating point of the festival. On the northern side of the shrine is planted a tree for the younger brother and on the west side a tree for the elder brother. The trees are branches of *tein-bin* and *kayabin*. The younger brother's tree is cut first. The *Nat-ôk* and *Natgadaws* all assemble in a lean-to on the northern side of the temple containing the images of seven *nats* before whom they pray and dance waving bunches of leaves and flowers in their hands. Then a procession is formed, headed by four men bearing golden *dahs* as in the procession for the bathing ceremony. Then come the *Nat-ôk*, Chief *Natgadaw* and eight other queens, four wearing the headdress mentioned above and carrying *dahs*. Twice the procession leaves the shrine, walks round the tree and returns. On coming out the third time the procession dances round the tree three times, the *Natgadaw* or *Natteins* who carry *dahs* executing a kind of sword dance. A twig of the tree is then cut by the *Natgadaw* and the crowd rush in and tear the tree to pieces, fighting for the

bits. When the ceremony for the elder brother is to be performed the procession assembles in the temple itself and marches out and round the tree as before. On returning for the second time to the temple the *Nat-ôk* is robed rather in the style of a Burmese General and wreathed with heavy scented flowers. The procession then comes out again and the sword dance is performed as before. Now the *Nat-ôk* begins reeling as he goes round the tree under the influence of the *nats*. After the third time round the procession moves away leaving the *Natôk* standing alone before the tree. Then raising his *dah* he cuts a bit off the tree and again the people rush in and fight for pieces, which are supposed to bring good luck and are often planted in the fields to ensure good crops. The last evening is devoted to the dancing of the *Nat-ôks* and *Natgadaws* and *Nat-wins*. The *Nat-ôk* dances for upwards of an hour. At first the *Nat-ôk* dances only on the step before the shrine keeping his face towards the south, *i.e.*, with his left side to the images. This is a farewell dance to show their respect to another *nat* U Min Gyaw (Pakan Min) of Pakan village, Yesagyo Township, who is the brother-in-law of the Two Brother *Nats*. U Min Gyaw is addicted to strong drink. As the dance proceeds the *Nat-ôk* appears to become more and more intoxicated and when he pauses is held up by one of the *Natgadaw* or *Nat-wins* or other attendants. After some time of this, he has a scarf tied round his breast and puts flowers on his head and holding more flowers in his hand begins a still more violent dance. At the end of this he takes a small golden bowl in his right hand and holds it out for the pious to give alms. When this is full, holding it with his right hand over the top, he takes a golden cock in his left hand and retires some 10 yards from the step on the shrine and executes a very violent dance waving his arms in the air and jumping up and down, so advancing up to the steps of the temple. This dance represents cock fighting, of which Pakan Min was very fond before he became a *nat*. After performing this dance four or five times he indulges in some raillery with the *Natgadaws* or *Natwins*. By this time he is apparently almost unable to stand alone except when he is dancing. He now takes a bottle of brandy in his hand and executes a bacchanalian dance waving the bottle in the air and drinking from it. This is a sign that he is possessed by U Min Gyaw, the Pakan Min. This dance is then repeated with a bottle of some other spirit

and he then sinks exhausted to the ground and is fanned and wiped by the *Natgadaws* or *Nat-wins*. When he has recovered an adjournment is made to his house where the *Natgadaws* and *Nat-wins* continue the dance. This is the end of the festival and the *Natgadaws* and *Natwins* are now free to return to the homes.

On the next day the images are gilded and preparations are begun for the annual journey of the Brothers to visit their mother at Mt. Poppa which begins ten days later with the Yadanagu Festival at Amarapura.

The cutting of the *tein-bin* is the great event of the festival and various explanations of it are given in the legends which have grown up round the Two Brothers, but none of them are very satisfactory. One—obviously a later invention—is that Anawrata on his way to China made the Tein *nat* came down from his tree and *shikko* him. After nursing his wrath for some time the *nat* took the form of a buffalo and gored Anawrata to death, and the Two Brothers in revenge cut down all the *tein* trees in the kingdom. Again it is said that when the brothers went a-hunting a *tein-bin* was always made the rendezvous. Such places were afterwards regarded as consecrated and there the kings and princes offered prayers to the *nats* for the welfare of the kingdom and people and entreated a sign for their guidance. So to this festival the Burmese kings used to send their ministers to watch for any sign that might be given.

This festival of the Two Brothers has been treated at some length because it is of far more than local importance in its bearing on the history of religion. The disciples of the Golden Bough see in it a definite survival of the worship of the Nature Spirit—the bathing of the images to bring rain, the offering of fruit and flowers to induce the Spirit to grant an abundance in the coming year, and the cutting of the tree a survival of the human sacrifices with which the death of the *Daimon Eniautos* was yearly represented. Sir William Ridgeway, on the other hand, regards this festival as but further evidence that primitive religion was founded not on the worship of the Nature Spirit or the Year Spirit or any such vague impersonality, but on the worship of men who had made their names famous in their lives or by the manner of their deaths.

2. ***Maung Po Tu*** was a native of Pinya and lived in the reign of Patama Mingaung (1401-1422). He travelled to Thônzè, Moméik, Thibaw and Taungbaing as trader in tea, and on his way back was killed by a tiger at the foot

of the hills near Letkaung village. He became a *nat* and made friends with the Shwesitthin *nat*. They lived together and are generally known as the *Minhnapa*. Maung Po Tu's wife, a Shan woman called Mi Hnin E, remained behind in Taungbaing. At the festival the guardian of the shrine and the medium wear red *pasos* with one end thrown round the neck, red coats, and red turbans with a gold edge. On the left shoulder is carried a sword with a piece of cloth fastened on it to represent a bundle; a bunch of *eugenia* is held in the right hand and the action of driving back bullocks is imitated. The medium also imitates a tiger drinking water. The ode describes how Maung Po Tu, a native of Pinya, to the south of the royal city of Ava, went to Thônzè, Thibaw and the Palaung country at all seasons of the year driving bullocks loaded with tea, in which he traded. There he met his wife Hnin E. Times out of number he had made the journey, with his red bullock at the head of the string; he had had no sickness and had met no trouble on the road. But one day on the Kaladaung he happened to offend a *nat* by sticking upright in the ground the wooden spoon with which he stirred his rice pot. In spite of Hnin E's dissuasion he set out once more and came to a dark forest at the foot of the Ôngyaw Hill. In the cool of the evening he made his camp there and lay down on his pack. He dreamed that his hair, which his wife had dressed, and his right shoulder, on which she had laid her head, were cut off. Suddenly he woke up and went to drink from a stream to which the angry *nat* directed him. There at the bottom of the hill, beneath a bamboo clump, he came face to face with a tiger which killed him before he could escape. Afterwards he became a *nat* and made friends with the Shwesitthin *nat* and wore the same kind of clothes that he did. Buds of the tea plant and clear water are offered to him. Gongs are beaten and wind instruments blown and a song sung, calling on Maung Po Tu of the white earrings to come up with his load; to which he replies that he will come and drive his load to Mogôk Kyatpyin. It is said that Shwesitthin, who was a son of Sawmun of Pagan, inspired one of the Court ladies to declare that Maung Po Tu had become Shwesitthin's friend; so the king allowed Maung Po Tu to wear the same court dress as Shwesitthin. In pictures and images he is represented as riding on a tiger and driving it with a stick.

3. ***Mandalay Bodaw nat*** was the son of a *pônna*, and a minister of Anawrata, who handed over the Two Brothers, *Shwepyingyi* and *Shwepyinngè*, to him to look after when they were young. When Anawrata ordered the Two Brothers to be killed he ordered that Bodaw be killed too; but Bodaw put his Brahmin's sacred thread round a stone elephant and brought it to life. He attempted to escape on the elephant but was seized, bound hand and foot, and killed at Mandalay. Before he died he declared that he had done no wrong, not even with his finger-tip; and he is usually represented holding out one finger. He is called Bodaw because the Two Brothers addressed him as *apho*, *i.e.* grandfather. His shrine is at the south-east corner of Mandalay Hill; and behind it is a rock-shaped like an elephant. At the festival the guardian of the shrine and the medium wear *pasos* with a border of foreign pattern, wide sleeved coats, and reddish-brown gilt helmets with a white emblem. In their right hands they carry fans, in their left hands swords and eugenia leaves. They fan themselves three times and recite the ode. Afterwards they put down their fans and swords and dance. Certain postures in the dance are said to be borrowed from the *pônna nautch*, and refer to the *nat's* parentage.

4. ***Shingwa nat*** was a sister of Mandalay Bodaw *nat*, and was killed by Anawrata at the same time as her brother. At the festival the guardian of the shrine and the mediums wear *tameins* with a border of foreign pattern, wide sleeved gowns (such as were worn at Court by ministers), white scarves, and turbans of golden yellow. Some versions say that the Shingon *nat* was also a sister of Mandalay Bodaw *nat*, others that the names of the sisters were Sègadaw and Kugadaw. Still another version says that his brother as well as his sister were killed along with the Bodaw *nat*.

5. ***Shingôn nat*** was the mistress of Sinbyushin Thihathu (1422—1426) who became the Aungbinlè Sinbyushin *nat*, after his death at Aungbinlè in a fight with the Sawbwa of Hsipaw. Shingôn *nat* died at Ava on her return from Aungbinlè. The guardian and mediums are dressed as in the festival of the Shingwa *nat*; they carry fans in both hands and go along in a bowed and shrinking attitude.

6. *Aungbinlè Sinbyushin nat* was Thihathu King of Ava (1422—26). He was killed on an elephant by the Hsipaw *sawbwa* while he was looking after paddy cultivation below the Aungbinlè tank. At the festival the guardian and mediums wear the dress of royal persons and carry gold elephant goads in their left hands. In their right hands they carry *eugenia* leaves and making a noose of their white *pasos*, they pretend to drive an elephant. After reciting the ode they hold the *eugenia* leaves in their right hands and pretend to plant paddy. The ode recounts the life of the *nat*, traces his descent, promises to all cultivators his assistance in securing them good harvests; and exhorts them to strengthen the bund of the tank.

7. *Mintha Maung Shin nat* was the son of Minshinsaw (died 1167 A.D.), who founded the forts of Kyaukthanbat and Bodet. While a novice in a monastery he fell from a swing and was killed; he is also called *Htan* Maung Yin because of this. At the festival the guardian and mediums wear yellow robes like a novice and recite an ode recounting the story; then they clasp a lute and dance while playing it.

The annual pagoda festivals are a prominent feature in the lives of the people. No less than 40 of these jovial gatherings are held in the district in the course of the year—mostly between the end of the Buddhist Lent in Thadingyut and the coming of the hot weather in Tabaung. The most important are those associated with the Mahamyatmuni or Arakan Pagoda, the Eindawya Pagoda, the Ayeikmatwet Pagoda and the Kyaukdawgyi Pagoda in Mandalay Town, the Sudaungbye Festival at Taungbyôn and the Yadanagu Festival near Amarapura which are connected with the worship of the Brother Nats of Taungbyôn, and the Shwezayan Pagoda Festival. These gatherings "are the scene of much activity, pious, social and commercial. Cheerful family parties of gaily clad villagers drive in from all sides, amid clouds of dust urging their bell laden bullocks to their fastest paces. On arrival they worship at the pagoda, meet their friends and make their annual purchases of such commodities as are not available at the ordinary 5-day bazaars." This description of pagoda festivals in Kyauksè may be held to apply also to similar gatherings in Mandalay.

Below is a list of the different festivals :—

Serial No.	Township.	Name of Festival.	Name of Village.	Date From	Date To
1	Mandalay	Mahamyatmuni.	Mandalay	Tabodwè Lazan 12th.	15th
2	Mandalay	Shwemalè	Mandalay	Tazaungmôn Lazan 12th.	15th
3	Mandalay	Setkyathiha	Mandalay	Thadingyut Lazan 12th.	15th
4	Mandalay	Eindawya	Mandalay	Thadingyut Lazan 8th.	12th
5	Mandalay	Chanthagyi	Mandalay	Tazaungmôn Lazan 13th.	15th
6	Mandalay	Yadanamyisu.	Mandalay	Thadingyut Lazan 13th.	15th
7	Mandalay	Payathônsu	Mandalay	Thadingyut Lazan 9th.	11th
8	Mandalay	Shinbinpetlet. yesetlet.	Mandalay	Thadingyut Lazan 14th.	15th
9	Mandalay	Shwekyimyin.	Mandalay	Tazaungmôn Lazan 13th.	14th
10	Mandalay	Payani ...	Mandalay	Natdaw Lazan 13th.	14th
11	Mandalay	Ayeikmatwet.	Mandalay	Natdaw Lazan 10th.	15th
12	Mandalay	Kyauktawgyi.	Mandalay	Thadingyut Lazôk 1st.	3rd
13	Mandalay	Sandamani	Mandalay	Thadingyut Lazôk 1st.	3rd
14	Mandalay	Lawkamayazein Kuthodaw.	Mandalay	Thadingyut Lazôk 1st.	3rd
15	Amarapura	Shwegyetyet Shwegyetkya	Shwegyetyet	Kasôn Lazan 15th and Tawthalin Lazan 8th.	...
16	Amarapura	Yadanagu	Myinzaing Ngèdo.	Wagaung Lazôk 8th.	15th
17	Amarapura	Aungmyinshwebôn.	Amarapura	Natdaw Lazan 14th.	15th
18	Amarapura	Kyaukka	Amarapura	Thadingyut Lazôk 3rd.	4th
19	Amarapura	Mahasetkyathami.	Amarapura	Kasôn Lazan 10th.	12th
20	Amarapura	Thattatana	Amarapura	Thadingyut Lazan 7th.	8th

Serial No.	Township.	Name of		Date	
		Festival.	Village.	From	To
21	Amarapura	Taungmin-gyi.	Amarapura	Tabaung Full-moon.	...
22	Amarapura	Nagayôn	Amarapura	Tazaungmôn Lazôk 3rd.	4th
23	Amarapura	Shwepaya	Amarapura	Thadingyut Lazan 10th.	11th
24	Amarapura	Shwezayan	Shwezayan	Tabaung Full-moon.	8th Lazôk.
25	Amarapura	Môndaw Nagayôn.	Môndaw	Tabaung Full-moon.	8th Lazôk.
26	Madaya ...	Sudaungbye	Taungbyôn	Wagaung Lazan 11th.	15th
27	Madaya ...	Thissaya	Pinya ...	Tawthalôn Lazôk 12th.	14th
28	Madaya ...	Shwekugyi	Madaya ...	Thadingyut Lazan 6th.	8th
29	Madaya ...	Shitmyetna	Madaya ...	Tazaungmôn Lazôk 1st.	3rd
30	Madaya ...	Shwe-nyaungdaw.	Madaya ...	Thadingyut Lazôk 3rd.	5th
31	Madaya ...	Shwemôk-taw.	Lundaung	Natdaw Lazan 13th.	15th
32	Madaya ...	Shwebôntha	Lundaung	Pyatho Lazan 6th.	8th
33	Madaya ...	Payathonzu	Lundaung	Tabodwè Lazan 13th.	15th
34	Madaya ...	Tawbu ...	Tawbu ...	Tabaung Lazôk 11th.	15th
35	Madaya ...	Pèpaya ...	Ônhmin ...	Natdaw Lazôk 1st.	3rd
36	Singu ...	Shwemôktaw	Singu ...	Tawthalin Lazan 7th.	10th
37	Singu ...	Sudaungbye	Tôngyi ...	Tawthalin Lazôk 7th.	11th
38	Singu ...	Myweandaw	Mywe ...	Wagaung Lazôk 6th.	9th
39	Singu ...	Shwemalè	Malè ...	Tagu Lazan 11th.	Lazôk 1st
40	Singu ...	Shwedaung U	Ketthin ...	Thadingyut Lazan 12th.	15th

CHAPTER IV.

AGRICULTURE AND IRRIGATION.

Part I. Agriculture.—Description of Agricultural Land; Plains; Hills; Soils; Agriculture at Original Settlement; Areas under different Crops; Implements; Methods of Cultivation—Paddy—Betel Vines; Note on Crops and Agricultural Practice; Grazing Grounds; Live Stock, etc.

Part II. Irrigation.—Historical; Taunggan Tank—Kangyi Tank—Nanda Tank—Aungbinlè Tank—Tamôkso Tank—Shwelaung Canal; Dinga *chaung*; Shwetachaung Canal; Myaungmadaw Canal; Present day irrigation from Government works (*a*) Mandalay Canal—(*b*) Shwetachaung Canal (*c*) Taunggan Tank (*d*) Tônbo Canal; Irrigation from Private Sources.

PART I—AGRICULTURE.

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Mr. Maxwell Laurie described the tract as "a cultivable plain sloping upwards by a gentle gradient from the banks of the Irrawaddy to the base of the western slope of the Shan Hills. About half way between the Irrawaddy and the Shan Hills, the western and eastern boundaries of the tract, this gradient is broken by a ledge of high-lying land which runs from Nyaungnibin on the banks of the Myitngè through Mandalay Town and then northwards between the Shwetachaung and Dinga *chaung* to Madaya. This strip of *kôn* marks the natural eastern limit of Irrawaddy inundation. North of the Chaungmagyi the limits of inundation are less clearly defined: there is no well-marked strip of high-lying land forming an impassable permanent barrier. There is, however, a line of highest flood. The area may therefore be broadly divided into two tracts, the western, which is, and the eastern, which is not, subject to annual inundation. A further division might be made into a northern and a southern tract. The northern is characterised by absence of irrigation works on a large scale. The eastern part of the northern division consists of a rough broken tract of hills cultivable and uncultivable high land and low land on each side of hill streams. These streams have a general direction towards the south-west or north-west, not due west like the Chaungmagyi. The northern division is also characterised

by an appearance of moistness and verdure and the hills are clothed with trees and grass whereas the arid appearance of the hills in the southern tract due east of Mandalay is their most conspicuous feature. The abruptness of the western slope of the Shan Hills between Tônbo and Lamainggyi is sufficient explanation of this. The western or river-inundated portion of the northern tract is similar in general appearance to the corresponding portion of the southern. This abruptness and aridity of the southern and the comparative moistness of the northern tract have an effect on cultivation which is discussed below."

Description of Agricultural Land—Hills. In the Maymyo Subdivision there is a strip of settled cultivation running from south-west to north-east, traversed by the metalled road and railway from Mandalay. On the eastern border of the district there is a southern branch of this strip from Wetwun to Holein, and cultivation is extending along the north-east border of the subdivision. Everywhere it is hemmed in by the Forest Reserves and consists mainly of paddy land and market gardens irrigated from local streams and springs, with some *ya* and *taungya* cultivation on the hill-sides.

Soils. The agricultural land was divided by the Original Settlement Officer into five *kaukkyi* tracts. In the first, which is, inundated by the Irrawaddy and irrigated from the Shwetachaung, he characterised the soil as 'a thick, heavy clay and very absorptive. This paddy clay not only requires an abundant supply of water before ploughing can begin, but must also be constantly and lavishly irrigated during the growth of the crop." The second tract lay south-east of Mandalay Town and due east of the ridge described above. "It is therefore entirely excluded from river inundation with the exception of one or two *kwins* on the banks of the Myitngè which receive from that river annual but not particularly fertilizing floods." Here the soil is for the most part a stiff paddy clay or "cotton soil"; in the southern portion it is of lighter texture. Tract 3 was the area commanded by the old Shwelaung Canal. Here the soil was found to vary in texture. "In some places it is a free friable soil which might be described as a sandy loam; in other places it is the ordinary stiff paddy clay or "cotton soil." It is possible however that these soils have the same properties in common and that they are both, while being extremely absorptive, not at all retentive of moisture. Tract 4 consisted of that part of the district which is flooded annually by the Irrawaddy but is not irrigated. "It

was at first attempted to classify this tract by levels, but it was ultimately found that the uplands and the hollows had counterbalancing advantages and disadvantages. The soil in the hollows is somewhat richer than that of the uplands, but the hollows naturally remain longer under water and cultivation is thereby retarded. In a dry season the uplands suffer from drought; in a wet season the paddy in the hollows is retarded and damaged by the depth of the standing water. The *kwins* which were swept by the flood of the main river were found to consist of a poorer class of soil than those *kwins* which, being out of the main current, were slowly submerged by water entering through creeks. There would appear to be a process of denudation at work as well as of alluvial deposition on these river-swept *kwins*. Rich alluvial deposits are found only on the lowest lands, the higher lands receiving hardly perceptible accretions. The better class of land is found in those *kwins* which are protected from the force of the main current The islands are therefore inferior for purposes of paddy growing to the mainland riverine *kwins*. The mainland *kwins* of Singu are protected by steep banks which break the force of the main current of the Irrawaddy and allow water to enter the paddy fields through deep creeks, which at places cut through the river. South of the Chaungmagyi an immediate change is perceptible, the soil of the mainland riverine *kwins* being of the same class as that of the river swept *kwins* further north. The alteration is accounted for by a change in physical configuration. The steep banks which characterise the Irrawaddy north of the Chaungmagyi are replaced south of the Chaungmagyi by low shelving banks which allow the full sweep of the river current to cross the low-lying level main land *kwins*. The soil shows a difference at once, becoming thinner and sandier; it is in fact not at all the kind of soil which is at once recognised as being a paddy soil."

The fifth tract "is not inundated nor is it fed from Government irrigation works. It consists of the rough broken land lying east of the limit of river flood, east of the Shwelaung, and east of the northern and southern Tawdwin Canals. It is watered from hill streams only, which for more than six months in the year are mere dry beds of sand and cannot even in the rains be depended on to flow for more than an hour or two at a time. Paddy cultivation is therefore precarious. The tract consists largely of cotton soil with patches of sandy loam."

The First Revision Settlement Officer classified the soils as follows:—

Tract.		Description of Soil.	
Original Settlement.	Revision Settlement.	Burmese.	English.
1	I, II, VII	Myethanôn	Clay of fine quality with silt
		Sanèmyetha	Rich loam.
		Thèwun ...	Loose sandy soil.
		Thèwunkyat	Loose sandy surface with subsoil clayey.
		Thènon ...	Sand with rich silt.
2	IV B	Sanèmyetha	Rich loam.
		Sanèputchi	Inferior cotton soil.
3	III, VI A	Sanèmyetha	Rich loam.
		Sanèputchi	Inferior cotton soil.
		Thèkyat ...	Clay with admixture of sand, hard when dry.
4	IX, X, XI	Myèthanon	Clay of fine quality with silt.
		Sanèmyetha	Rich loam.
5	IV, V, VIII	Sanèmyetha	Rich loam.
		Sanèputchi	Inferior cotton soil.
		Thèkyat ...	Clay with admixture of sand, hard when dry.
		Sanèkyat ...	Poor cotton soil but retains moisture well.

Black cotton soil along the foot of the hills east of the Mandalay Canal, and in the unirrigated *kwins* north of the Myitngè a light red loam, are most suitable for cultivation of non-paddy crops. South-west of Mandalay dry crops are raised on ordinary cotton soil and sand mixed with clay, the former predominating. Along the Chaungmagyi there is an excellent sandy loam, on which plantains are grown; but south-east of that river, in the part of the Original Settlement Officer's fifth *Kaukkyi* Tract which lies south of the Chaungmagyi, the soils are fine loose sand (known as

thèwun) or sand mixed with clay (*thèkyat*). In the uninundated portion of the Singu Township dry crops do well on a loose sandy soil but other soils are poor.

In his Review of Mr. Laurie's 1891-93 Settlement Report the Financial Commissioner (Mr. Smeaton) wrote as follows:—

"The key to the present agricultural situation in the Mandalay District is to be found in the following facts: —

First.—The rainfall of the district is altogether insufficient in volume and untimely in distribution for habitual paddy cultivation.

Second.—About twenty-five years ago, during the reign of King Mindôn the district was fully equipped with irrigation works which more than made up for the deficient rainfall and supplied sufficient water to enable paddy to be habitually and successfully cultivated over the greater part of the district.

Third.—During the period from the accession of King Thibaw, sixteen years ago, till the Annexation all these irrigation works with one exception had steadily gone to wreck and the area watered up to the paddy growing standard had dwindled to, and now is, not much more than one tenth part of the similarly watered area twenty-five years ago.

Fourth.—Notwithstanding this, the cultivators of the district persist in attemping to raise paddy all over the tracts which were formerly irrigated trusting to the luck (which rarely comes) of an abundant and timely rainfall, and (in a few favoured spots) to odds and ends of frail, petty and temporary storages of hill streams and other drainage to make up for the deficient rain.

Fifth.—Hardly anywhere, except in the permanently irrigated tract, do the cultivators reckon on getting, or get, a remunerative paddy crop more than twice in about five years; and that, too, only in the few favoured spots where a hill stream, or other natural drainage, is temporarily, or at considerable risk, impounded. In the large central plain of the district one crop in five is a good one, one is a fair one, and the remaining three are generally partial or complete failures. In the few small oases, even, the permanent conditi n is not much better, for the little storage works are frail and often swept away, or the impounded water is too late to be of use: but if there be luck two good crops and one moderate one are got in five seasons, and the remaining two are failures.

Sixth.—Notwithstanding this, paddy is attempted every year in many, if not most, of the holdings in which it had never been previously raised; and thus, during the years of partial or total failure, the season during which other remunerative crops could be successfully raised passes away and the cultivator, at his wits end what to do, sows often at random any seed which he thinks may within the time left to him, yield a crop with which to weather the coming dry season and help him to pay his *thathameda*.

Seventh.—Thus in all but the permanently irrigated and the alluvial tracts and the few little oases the condition of agriculture is little better than chaotic. There is no certainty of a paddy crop: profitable crops, which can live and thrive on the natural rainfall, and which would repay the cultivator but which need care diligence and watching are neglected even when understood, are not unfrequently sown out of season (because paddy must always get the first chance) and haphazard: and the cultivation of the more profitable staples is little understood and still less called for.

Areas un Different Crops.

The following table shows the acreage of different crops in 1892-93, 1902-03, 1912-13 and 1921-22:—

Crop.	1892-93.	1902-03.	1912-13.	1921-23.
Mayin ...	21,953	14,381	15,061	13,228
Kaukyin ...	3,774	5,245	3,302	3,255
Kaukkyi ...	20,728	43,662	99,217	90,198
Wheat ...	750	4,803	107	
Maize ...	706	1,522	755	6,780
Gram ...	2,876	4,548	557	1,888
Pègyi ...	13,236	11,029	17,335	7,494
Pèbyugale ...	3,283		...	24,999
Pègya ...		9,830	6,015	5,955
Pèyin ...	121	510	1,580	1,793
Other beans ...	951	11,922	9,770	12,217
Groundnuts ...	137	...	66	188
Sesamum ...	7,384	11,427	9,033	6,544
Chillies ...	1,878	1,765	1,502	937
Sugarcane ...	59	90	1	58
Cotton ...	6	84	34	68
Tobacco ...	2,827	2,083	3,945	3,382
Fodder crops ...	5,420	14,025	3,650	4,941
Plantains ...	1,006	4,580	3,612	3,576
Mangoes ..	5,139	2,971	1,994	2,487
Other orchards * ..		2,852	3,390	3,608
Onions ...	1,452	1,311	1,531	1,032
Goa beans ...	...	46	722	758
Tomatoes	580	1,386	1,135	1,446
Other vegetables ..	906	2,865	3,314	3,554

* Includes coconuts, betel palms and betel vines.

ents. The Descriptive list of Indigenous Agricultural Implements, Machines, etc., in use in Upper Burma, issued by Government in 1893, was compiled with primary reference to Mandalay. It contains 97 items, of which the most important are given below, with their cost in 1893 and in 1923.

Serial Number.	Name of implement.	Price in 1893.			Price in 1923.		
		Rs.	A.	P.	Rs.	A.	P.
1	Long mat	1	0	0	1	4	0
2	Gunny bag	0	4	0	0	6	0
3	Bamboo basket ...	0	4	0	0	8	9
4	Bamboo ties ...	0	2	6	0	6	0
5	Plough	3	12	0	8	4	0
6	Harrow	2	12	0	2	5	0
7	Log for smoothening surface	1	8	0	1	14	0
8	Threshing floor leveller ...	5	0	0	0	14	0
9	Cart	40	0	0	69	10	0
10	Hatchet	1	4	0	1	13	0
11	Chopper	1	8	0	2	1	4
12	Hedge bill ...	1	8	0	1	11	4
13	Hedging fork	0	6	0	0	10	0
14	Pitch fork ...	0	12	0	1	0	0
15	Thrust-hoe (narrow) ...	0	12	0	1	10	0
16	Hoe	0	12	0	1	11	7
17	Thrust-hoe (broad) ...	1	0	0	1	10	10
18	Turf-spade	1	0	0	0	9	2
19	Round bamboo tray ...	0	4	0	0	7	0
20	Round bamboo sieve ...	0	4	0	0	7	0
21	Wooden basket	5	0	0	7	0	0
22	Bamboo basket	1	8	0	3	2	0
23	Wooden scraper .	0	6	0	0	9	0
24	Broom	0	6	0	0	9	0
25	Threshing stick ...	0	4	0	0	4	8
26	Seed harrow	0	8	0	0	9	2
27	Bamboo hat ...	1	0	0	0	9	7
28	Sickle	1	0	0	0	9	2

For paddy cultivation the essential implements are the harrow, the plough and the clod-breaker. The harrow (*htun*) is made of hardwood and bamboo, the woodwork being in one piece and consisting of a substantial log five to six feet in length with holes for teeth of which three, five or seven are inserted according to the nature of the work to be done. On top of this log a curved bamboo is fixed affording a support for the hands and a means of turning the harrow. Two straight bamboos are attached to the log, these form the shafts to which is attached the yoke. The

plough (*tè*) is made of hard wood such as *padauk* with an iron share; it has a handle and support, and a shaft which is fixed to the yoke. The clod-breaker (*kyandôn*) is a log of wood used for smoothing the surface of ploughed fields. It is a straight log of wood eight feet in length and six inches in diameter.

Methods of cultivating Paddy.

The method of cultivating paddy on riverine land is similar to that practised in Lower Burma. On irrigated land a nursery is first prepared, and the seed sown by men. The land is ploughed and harrowed and smoothed by men. The seedling plants are uprooted and transported by men, and planted by women. The irrigation of the growing crop is seen to by men and the crop is harvested by men and women together, the women doing most of the reaping and winnowing, the men the carting and threshing. The following description by Mr. Maxwell Laurie of the cultivation of irrigated paddy (with particular reference to the amount of irrigation required to supplement the rainfall) is generally applicable still." The cultivation of *Kaukkyi* is carried on during the eight months June to January. There is usually irrigational water available by the month of May, occasionally even in the latter half of April. To moisten the soil properly for the first ploughing five inches of water are necessary. As the best land is ploughed and cross ploughed eight times, three or four additional supplies of water averaging five inches each have to be let in. Seed is sown, or seedlings are transplanted according to circumstances. On low lying and favourably situated land seedlings are planted, on high land and land remoter from the water source seed is broadcasted, as on these lands the season of growth is shortened by the later arrival of the water supply. The seedling nurseries are prepared about forty days before the date when ploughing ordinarily commences, and the young plants are removed and planted out when they have attained a height of 15 to 18 inches. They are dibbled into the paddy fields which have been plastered by frequent ploughing and watering. In average *Kaukkyi* the corn begins to fill about 113 days after planting, 14 days later the ear is clear of its case, and after 21 days of growth in the open air it is ripe. The best *Kaukkyi* paddy fills in 133 days and ripens about 35 days later. The last dole of irrigation is given about 25 days before harvest, the field drying up gradually as the day for reaping approaches. *Kaukkyi* is reaped in December or January. The field is left fallow for 60 to 75 days.

Kaukti nurseries are planted near main irrigation channels or large tanks which are at their lowest in February and March. The seedlings are ready in the Burmese month of *Tabaung*. *Kaukti* is broadcasted in the early part of *Tabaung*, or transplanted from nurseries in the later part (March). The great heat and dryness of the months of April and May and June make *Kaukti* a thirsty crop: it drinks an average of an inch of water per diem during the seventy days between planting out and the final exclusion of irrigational water. *Kaukti* is, although it remains only three to four months on the ground, almost as heavy a drain on the canals as *Kaukkyi*."

ines. The standard type of garden (*kun-gôn*), to which the cultivators of Madaya in their estimates always refer, is the *Sè-kan-tapet* consisting of ten compartments (*kan*) with two trenches in each. Each trench contains one row of vines, in the majority of cases of eight or nine poles, that is 16 or 18 poles per *kan*. There are generally more vines than one per pole but the word vine is used here to denote the pole whatever the number of vines climbing up it may be. The number of *kans* vary from 4 to 30 per *kôn* and the number of poles per trench from 4 to 22 but 50 per cent. of the *kans* in the Madaya gardens have 8 poles per trench and 42 per cent., 9 per trench. The poles are remarkably symmetrical in their spacing; in nearly every case each pole is two cubits each way from the adjacent poles, *i.e.* the trenches are two cubits apart and the poles in each trench are two cubits apart. In some cases they vary perhaps 3 inches closer or wider apart but on the average there is one pole per square yard or 4,840 per acre. The poles (*saikwa*), 12-15 feet high, up which the vines climb, are kept erect by a trellis work which also gives access to the leaves of the top of the vine; the standard 10 *kan kun-gôn* is erected as follows:—there are 11 rows of 5 posts of wood, stout bamboo or betel palm 6 feet each way from their neighbours. Breadthwise between each of the 11 rows of posts run two trenches, the two trenches constituting a *kan*. The posts are about 6 feet high and are connected lengthwise in each row by a bamboo on either side of the post, resting on a short cross piece driven through the post six inches from the top. These bamboos are called *paung-gôn-wa* and the crosspiece is known as *kaladet*. On top of these, running breadthwise, are single bamboos connecting the shorter rows of posts; these are known as *gya-wa*. Parallel with them and midway between them (up the

centre of each *kan*) are lengths of single bamboos called *gya-wa* also. Again on top of these on each side of the vine poles running both breadthwise and lengthwise are double sets of bamboos. These are called *hnyat-wa*.

The above description is for an eight pole *kan*; for a nine pole *kan* the vine poles are placed between each double row of *paung-gon-was* (5 poles) and the remaining 4 poles each midway between each row of *paung-gon-was*; it is thus possible to plant 9 poles in a trellis work of exactly the same size às that for eight poles and the vine poles will still be each a yard apart.

Occasionally one set of *gya-was* are omitted but the majority of *kôns* are as above. It will be noted that the *hnyat-wa* are not split bamboos as is the case in Minbu, *vide* paragraph 5 of page 178, Minbu Revision Settlement Report 1904-07.

As the Madaya method appears to be needlessly expensive, enquiries were made why split bamboos were not used instead of whole ones and the reply was that split ones would not support the *myin* or stool which is placed on the top of the trellis work to enable the plucker to reach the tops of the vine poles 12 to 15 feet high. This would seem to indicate that the charms of the Madaya ladies (women are employed to do the plucking) run to more ample proportions than those of their Minbu sisters. Artificial shade is rarely employed in Madaya, the surrounding betel palms, coconut palms and other fruit trees giving ample shade. In exposed positions however a light framework of split bamboo is supported on uprights of split bamboos lashed to the posts of the trellis work and covered with betel and coconut palm leaves above the posts of the vines.

Each *kôn* is connected by a trench with a well and the trench runs down the long side of the *kôn* so that water may flow from it into each vine pole trench in turn. These trenches are closed with small bunds of mud which are removed one at a time to allow the trenches to fill with water and then closed. This is done with a small hoe. It therefore requires two persons to water a garden, one to raise the water and the other to direct it into the correct channel. Betel palms are planted at the edge of these irrigation channels and up these palms vines are trained.

The wells are nearly all constructed of brick; a few however are not bricked in but are supported by cylinders of plaited bamboo. The raising apparatus consists of a

stout post 9 or 10 feet high with a long lever hinged at the top; at one end of the lever is attached a wooden bucket by means of a long bamboo and the other end of the lever is counterbalanced with old bricks or bits of wood. The post is called *maungdaing*, the lever *maunglet* and the long bamboo attaching the bucket *letka-dôn-wa*. The bucket holds about 4 gallons The person operating this stands on a frame work immediately over the well or on a stage built over a distributary and forces the bucket down into the water whereupon the counterpoise raises it and it is tilted into the hollowed half of a palm tree whence it flows into the distributing trench. The wells are not used solely for the betel vines however; in the hot weather the betel palms, especially the young ones, are also watered occasionally.

Gardens are planted at the end of the rains about October. It is usual to bring silt with which to start the garden. The young plants are obtained from existing gardens by setting a length of vine as a runner in the ground and taking the shoots that spring from it. If the young plants have to be bought they cost about Rs. 5 per 100. About 5 or 16 *kyins* (large baskets) of new soil are required to start a garden at a cost of Re 1 per *kyin*. The complete trellis work is not erected at first but lengths of split bamboo are driven into the ground for the young plants to climb. The plants are not plucked for the first three years after planting but during this period are coiled twice (*kun-kwe*). This process consists in shortening the vine by pulling it down, coiling up the bottom 4 or 5 feet, and burying this coil at the foot of the pole and then tying the remainder of the vine to the pole again. The object is to prevent the bottom portion of the vine getting woody and bearing no leafy shoots Fresh vines also shoot up from the buried coiled portion and replace vines that may die. The vines are now nearly all of the "Prome" Variety. The Burma Vine remains only in a few cases trained up betel palms.

After a garden has been established the following operations have to be carried out. Watering is necessary five or six times a month in the cold weather; during the hot weather once in three days and during the rains perhaps three times a month. One well waters three *kôns*. A *kôn* requires two cart loads of manure per year and 5 or 6 *kyins* of silt once in two or three years. Vines are coiled once a year in the cold weather and also require tying up occasionally at other

times. Roughly half the number of bamboos of the trellis work require renewing yearly and about the same percentage of posts if of bamboo or betel palm. Wood posts last five or six years or even longer. It is almost impossible to estimate the outturn with accuracy; 240 viss of leaves per *kôn* is probably a fair average.

After the third year the leaves are plucked on an average once a month. The vines are not stripped of all leaves, only those of full growth being taken and in any case the leaf at the tip of each shoot is always left. The leaves are then sorted by the pluckers and placed in baskets of about 10 viss capacity for transport. They are nearly all exported to Mandalay * the brokers who buy them taking delivery in the garden or at the bank of the Shwetachaung. In the more distant gardens where vine cultivation is at a minimum they are sold retail in the surrounding villages.

Crops and Agricultural Practice. The following Note on Crops and Agricultural Practice was supplied by Mr. A M. Sawyer of the Burma Agricultural Service.

"The Mandalay District may be described as an extensive plain covered with rice fields, which are intersected by hedgerows and dotted with trees Rice, to the cultivation of which an area of about 120,000 acres is now annually devoted, occupies most of the arable land and is, consequently, the principal crop. Nearly the whole of this vast area is irrigated by means of Government Canals, water to grow the crop on the rest being raised by waterlifts, such as the *gyat-set*, from streams, *ins*, backwaters and wells But for irrigation it is probable that the cultivation of rice might here have occupied the same precarious position that it does in the *mogaung* lands of the Tantabin dry tract (Shwebo District). The rice, or rather the rices of Mandalay, varying with the season in which they are cultivated more than the life of the crop on the field, are included in four agricultural races, *kaukti*, *mayin*, *kaukyin*, *kaukkyi*. Of these, *kaukti*, represented by *zalè*, its most popular variety, is practically confined to the banks of the Shwetachaung Canal, Madaya Township, where it occupies above 1,000 acres and is raised exclusively for local consumption (*wunsa*); the seed is broadcasted early in February, and the crop usually reaped late in April. *Mayin* now occupies about 17,000 acres, chiefly in the Townships

* There is a small retail trade in the Madaya Bazaar and villages near by.

of Madaya and Singu, the varieties commonly grown being *byat*, *byatgale*, *thida*, *ngamanu*, *yenwè*, *satha*, *metleik*. It is sown in nurseries close to flooded land, usually in the *kaukti*, season, and is transplanted as the floods recede in the early hot weather; the crop, often dense and vigorous, is irrigated by the *gyat-set*, or fed from canals. A new *ye-khayu* (water-screw) has been introduced by the Department of Agriculture and is gaining favour with the *mayin* cultivator. The yield of *mayin*, is often high (50-60 baskets per acre) and, though much of the paddy is awned and red-grained, it fetches a ready sale at the local mills. *Kaukyin*, of which *ngayabo* and *kalagyi* are well known varieties yields both red and white-grained paddies; it occupies about 2,500 acres on the riverine of the Irrawaddy in the Singu Township. *Kaukyin* is broadcasted or grown as a transplanted crop in the season May-October. Improved white-grained strains of *kaukyin* have been isolated at the Mandalay Agricultural Station and will, in due course, be distributed to cultivators. The chief advantage of growing a *kaukyin* paddy lies in the circumstance that it can be followed in the same year by gram or another, usually dry, crop before the cultivation season is closed by the hot weather. *Kaukkyi*, cultivated on an area of over 90,000 acres between the months of June and January, yields, as elsewhere, the main rice crop. Of the area under it, about 70,000 acres now grow the improved strains of *ngasein*, *taungteikpan*, and *shweat*, its principal varieties, evolved at the Mandalay Agricultural Station. These "selected" white-seeded strains yield 6 to 10 baskets more per acre than the cultivator's mixed varieties, besides commanding a premium in the market of Rs. 10 to Rs. 15 per 100 baskets, over the price obtained for the unselected grain. To cope with the demand for the seed, which is increasing, there are at present no fewer than 20 private-owned seed-farms in the District, besides the Mandalay Agricultural Station. *Kauklats*, grown elsewhere in the Province in the *kaukkyi* season, are seldom under cultivation in this district; but at the Mandalay Agricultural Station several improved strains of Upper Burma *kauklats*, some of which are suited to Mandalay conditions, have been isolated. The practice of the cultivation of rice in Mandalay does not present any marked deviation from that in vogue in most other parts of Burma. Manure, usually cattle-dung, when available, is dumped in heaps upon the land before it is cultivated, *i.e.*, ploughed or, more frequently, harrowed,

the *htun* rather than the *htè* and *set-htun* being the favoured implement of husbandry. The resultant shallow tillage is followed up by rolling the soil with the *kyandôn* or a harrow-head and reducing it with the requisite quantity of water to the oozy softness so essential for rice growing. Nurseries are crowded through sowing thickly, and no line planting is yet pursued but the close planting adopted in stocking the fields does not permit weed growth to any extent, though this is, perhaps, its only advantage. A cheap but efficient iron plough share with a mouldboard that can be attached to the ordinary Burmese *htè* and costing Rs. 2-4 to Rs. 4-4 is being introduced by the Department of Agriculture. An interesting feature of the Mandalay rice-fields is the prevalence upon them, soon after harvest, of a dense growth of the *katsinè-gyi* (*Xanthium strumarium*) which, after seeding profusely, dies down in the hot weather. No green manuring for rice is practised, but it is difficult to believe that the *katsinè-gyi* does not add something to soil-fertility or, at any rate, help to maintain such fertility through the decay of the millions of plants it produces year after year upon these fields. Rice-straw is largely fed to cattle; the crop is therefore, unlike the practice elsewhere, cut close to the ground and the straw stacked with care; the stubble, too, is seldom burnt on the field. No rotation-crops are usually grown; but *pè-myit* (*Psophocarpus tetragonolobus*) is raised, as an alternative crop, in some rice-fields, under irrigation in the *kaukkyi* season.

The only other crops of any importance which are produced on the *ya* lands of the Mandalay plain are *pyaung*, *hnan*, beans and vegetables. Of *pyaung*, *kun-pyaung* alone is now cultivated, chiefly in the Patheingyi and Amarapura Townships. Two crops are taken, one for green fodder the other for dry; both being sown in the early rains, often after but a single harrowing, at about a basket of seed to the acre. The green-fodder crop is cut from August to October and the dry fodder crop in December-January, average yield being 2,000-3,000 bundles (of 5 or 6 stalks) per acre. The fodder is chaffed and mixed with sesamum-oil cake or bran or both before it is fed; and, together with rice straw, is the mainstay of the cattle and ponies of the district. Saccoline, variety of sweet *pyaung* (*Sorghum saccharatum*), introduced by the Department of Agriculture from New South Wales in 1916, is proving to be a useful

fodder: it is this year reported as being under cultivation on about 30 acres in the Patheingyi Township. It matures for fodder in 3 months after sowing and, besides yielding about 3,000 bundles of sweet and succulent stalks that can be fed without admixture with bran or cake, it produces 8 to 10 baskets of a glutinous grain which is eaten by humans and fed to stock. About 9,000 acres are sown with *hnan*, most of it being in the Singu Township. *Hnan-gyi* (late sesamum), of which *thadunbyu*, *bôk*, *patlè*, *padetha* are typical varieties, is scattered in September on land harrowed for a fine tilth; it is harvested in December-January, and yields 5 or 6 baskets of seed. *Hnan-yin* (early sesamum) is grown on about 1,000 acres, chiefly in the Amarapura Township; the seed being scattered in February-March and a crop of 2 to 5 baskets cut in June-July. The beans more usually grown on the *ya* lands are *pègyi*, *pègya*, *pèbyugale*, gram (*kalapè*), *pèyin* and *pindaung myepè* (Spanish Groundnut). The common method pursued in the cultivation of these beans, except the *myepè*, is to broadcast a large quantity of seed, often as much as a basket per acre, after ploughing or harrowing the land, or to scatter the seed first and then plough it in; sometimes, however, a good tilth is secured before the seed is scattered or sown in lines. In the single weeding given the crop with the *pauktu*, it is thinned to some extent; but despite this thinning, the crop is often very thick and ill-ventilated and sometimes suffers from fungal parasites. Planting in lines, introduced by the Department of Agriculture is, however, though very slowly, gaining favour with the bean cultivator who now invariably adopts it for *myepè*. The gram at present under cultivation in the district was recently introduced by the Department of Agriculture; it is known to trade as "Karachi Gram" which, from its apparent immunity from wilt disease, has come to be known as "*hmo-lut-kalapè*". The Spanish Groundnut, yet another new crop introduced by the Department of Agriculture, is of erect habit and can therefore be sown with considerable profit even closely in the lines; its pods are clustered about the base of the stem, so that harvesting is both easy and complete; it matures early; and its oil-content is high.

A noteworthy, though not peculiar, feature in the agricultural practice of this district is the dry cultivation of mixed crops in the *kyuns* and sandy spits which are exposed in the bed of the Irrawaddy when the river runs low. This

"*kaing*" cultivation, as it is called, supplies a good deal of the food and money-crops of the people. It begins about November and is continued, without intermission, up to the end of the hot weather in May. For the six or seven months of its occupation by cultivation, the land is stocked with a variety of crops, such as maize, beans, tobacco, vegetables, melons, gourds, cucumbers and *sunn*-hemp. The loams and silts deposited on the *kaing* lands often vary in depth and physical character from field to field, year by year; so that, in any given season, the degree of tilth which is given the land and the kind of crop which it is to support are determined largely by the deposit upon it As a rule, the coarser silts and the more clayey loams are placed under maize, beans, tomatoes, *chinbaung* and other vegetables and the finer and higher usually reserved for shallots, potatoes and tobacco; but most of these crops may be mixed on the same field. The land is given thorough cultivation, *i.e.*, it is ploughed, rolled with the *kyandôn*, harrowed, and rolled again until a fine even seed-bed is secured. Although the tilth for most of the crops is good, it is particularly fine for shallots and tobacco. The utmost care is also given to the sowing or planting of most of the crops: for, except in the case of beans and maize and *chinbaung*, *mônhnyin* and some other vegetables, the seed of which are usually broadcasted, they are sown or planted in regular lines, clean weeded, and intercultivated. The weeding and tillage between the rows of plants, which have to be frequent from the exuberance of the weed-growth and for the conservation of the moisture in the soil, are invariably given by means of the *pauktu*. Except for *paiksan* (*sunn*-hemp), which is grown as a pure crop when it does not form the border of a field, the crops are mixed either for the whole or a part of their lives. As examples of some of the more favoured crop-mixtures may be cited those of *pègya*, *pèbyugale* or *pègyi* with maize or *chinbaung*; tobacco planted 4 to 6 feet apart between narrow beds of shallots or tomatoes, with a border of either *pèyin* or *pèlun*; potatoes or brinjals between rows of tobacco; brinjals, *chinbaung*, maize and *pèlun*; rows of potatoes between beds of shallots; *chinbaung* and brinjals with *bu* or *thakhwa*; tomatoes or chillies between beds of shallots or a double row of radish with *chinbaung* or *mônhnyin* sown as a border crop; *kazun-u* and *pè-seinsa*. The crops are harvested as they mature for leaf, fruit, seed or root; the earliest cut being the leaves of *chinbaung*, *pèlun*, *bu*, *mônhnyin*

kazun-u and radish which are sold as vegetables whilst waiting for the other crops, and the latest beans, *kazun-u pè-seinsa-u*, potatoes, shallots, tobacco; whilst, on the spits or stretches of sand are produced, often later even than these, *bu, thakhwa, thakhwa-cho, shwe-payôn, hpayè* and other gourds and melons. It is interesting to note that the shallot (*kyetthun-gale*) is grown from Indian bulbs purchased at the bazaars and the potato from seed-tubers imported from the Shan States, locally produced seed being, in either case, believed to yield indifferent crops. The cultivation of tobacco, which is extensive on the *kaing* lands, hugs the verge of the Irrawaddy through the length of the district; the local broad-leaved variety being, in many places, supplanted by a long and narrow-leaved variety which, grown and used under the name of "*lanka*", recalls the locality of its origin in Sumatra whence it was introduced by the Department of Agriculture. Coconuts, mangoes, arecanuts, betel-leaf, bananas, limes, lemons, pomeloes, guavas, pine apples, pomegranates, custard-apples and jack-fruit are produced in some of the villages in the plain. The chief centre for the cultivation of all these, except mangoes and custard-apples, is Madaya, the garden of the Mandalay District. There a fertile soil and adequate irrigation make it possible to raise these crops, primarily to supply the markets of Mandalay. No system is followed in the planting of the trees, which appear to be grown to shade the betelvines, and no cultural treatment beyond an occasional manuring seems to be given them throughout their lives. The betelvines, doubtless the principal crop here, are planted in regular lines, carefully trained to bamboo supports, and irrigated by the *maung-let* from wells or canals. The mango is grown throughout the district, but the gardens proper are confined to the red soils near the foot of the Shan Hills and the fertile silts on the banks of the Myitngè; the varieties most in favour being the *nettè sinbaung*, and *thôn-lôn-ta-daung*. The trees, always raised from seed, are often grown in the midst of a mass of other, usually jungle, vegetation but sometimes and particularly of late, planting in rows on clean land is adopted. The custard-apple thrives on the dark-brown loams at the foot of the Yankin-taung hill and its vicinity where the gardens under it are extensive and profitable. Condiments, such as chillies, coriander, onions and garlic, are often grown on these brown loams, but, with the exception of coriander, which is usually a paying crop, are poor both in stand and

yield. The *htan* (palmyra palm) is cultivated in most of the villages of the plains.

The cultivation of vegetables, by Burmans and Chinamen, to supply the markets of Mandalay, is extensive. It is conducted on the loams and silts between the *Payagyi* Arakan Pagoda and the brick-fields. Almost all the commoner European and Indian and some Chinese vegetables are usually grown, under hand irrigation from wells or the ditches left on digging out the clay for brick-making. The industry is pursued throughout all seasons, but is most active and profitable in the cold weather. A small green grape is grown at Amarapura.

There are three grazing grounds and two cattle paths—

Grazing Grounds.

(1) In Thayetkan South *Kwin* No. 337, 11·81 acres were allotted in 1923 as a grazing ground for the inhabitants of Thayetkan South village.

(2) In Tagundaing *Kwin* No. 594, 72·17 acres were allotted in 1922 as a grazing ground for the inhabitants of Tagundaing Village. This land belonged to the Society for the Preservation of Cows which has an asylum for cattle near Tagundaing Railway Station.

(3) In Kyauksègan East *Kwin* No. 143A and Tamagôn East *Kwin* No. 144A, 583·44 acres were allotted in 1910 as a grazing ground for the inhabitants of Yenatha, Tamagôn, Ôngôn, Khanpagyi, Thabyetha, Kyauksaritkôn, Tangathè, Zalôkkyi, Inma, Pinya, Myagôn, Thalunbyu North, Bemè, Kyatkôn, Alèbôn Villages and Madaya Town.

(4) In Nyaungbinsauk *Kwin* No. 585, Nyaungbin *Kwin* No. 586 and Mokagè *Kwin* No. 587 a cattle path 50 feet wide, with a total area of 11·27 acres. was reserved in 1908 for the inhabitants of Nayagan, Myitlaung, Sauktawwa and Nyaungbinsauk Villages.

(5) In Kangauk Kandwin *Kwin* No. 512B, Yankintaung *Kwin* No. 503A and Thayetkôn East *Kwin* No. 493, 19·07 acres were reserved in 1908 as a cattle path for the inhabitants of Kangauk, Thayetkôn and Yankintaung Villages.

stock,

The latest 1923-24 return gives the numbers of live-stock, ploughs and carts in the Mandalay District as follows :—

Oxen ...	Bulls ...	9,001
	Bullocks ...	46,255
	Cows ...	35,478
	Calves	23,705
Buffaloes ...	Bulls and Bullocks	3,905
	Cows ...	6,308
	Calves ...	4,630
Sheep ...	... ...	2,446
Goats ...	...	4,414
Horses and Ponies	Geldings ...	1,484
	Stallions ...	57
	Mares ...	1,242
	Colts and Fillies	336
Mules ...	.. ...	183
Pigs ...	... ...	2,931
Ploughs ...	... ...	19,422
Carts ...	... ...	16,026

Part II.—Irrigation.

rical.

Before the Annexation, irrigation in the Mandalay District seems to have followed the usual sequence ; first irrigation by means of the overflow from the torrents which come down from the Shan Hills ; next irrigation by means of weirs across those torrents to ensure the overflow ; next irrigation by canals taking off from the torrents above the weirs ; then by storage tanks or reservoirs ; and finally by means of canals taking off from a river. In the Singu Township irrigation is now much the same as it was before the Annexation. South of Chaungmagyi there was a number of tanks, the largest of which were the Taunggan, Kangyi, Nanda, Aungbinlè and Tamôkso Tanks ; and four canals the Shwelaung, Dinga *chaung*, Shwetachaung and Myaungmadaw.

gan

The Chronicles contain no reference to the Taunggan Tank. It is reputed to have been dammed by Alaungsithu (1112-1167). In more recent times according to local tradition it was dug in Mindôn's reign by State prisoners put under the charge of the Hlesa *bo* also called the Taunggan Shwehle *Sèhnaywa bo*. The prisoners were allotted to twelve villages, *viz.* Nyaung-u, Taunggan, Magyigôn, Tamagôn, Thandaw, Nyaungbintha, Myaungzôn, Sadaiktaga, Myaunggwè, Paungdaw-u, Kôntha, Tada-u. In these they lived and cultivated the land irrigated from the tank.

Kangyi Tank also known as *Kangyi Kanhla*, is said to have been dammed by Minshinsaw. It was repaired by Bodawpaya's Heir-Apparent. **Kangyi Tank.**

This tank is said to have been dug by Alaungsithu (1112-1167 A.D.). It was repaired by Bodawpaya in 1788 A.D. who thought it would be both useful and ornamental to have a large stretch of water (formed by the Nanda and Aungbinlè Tanks between his capital and the Shan Hills on the east. The bund was raised for four miles from Mandalay Hill to the Kalamadaung, and the tank was fed from the Shwelaung Canal. The dimensions of the bund were : height 30 feet, width at bottom 162½ feet, width at top 21 feet. The land irrigable from the tank was given out to be cultivated by Lamaings, or royal labourers. **Nanda tank,**

The Aungbinlè Tank is said to have been constructed by Minshinsaw in 1151 A.D. It was repaired by Bodawpaya in 1788 A.D. The Kônbaungzet gives the dimensions of the bund as : Height 37·5 feet, breadth at bottom 105 feet, breadth at top 21 feet, and the length of the bund as just over five miles from Kandwin-Sèdaw Village to the foot of Mandalay Hill. The distance was measured from the famous *nat*-shrine of Sinbyushin of Ava on the east of Aungbinlè Village The tank was filled from the Kyunwun Weir and Myaungmadaw Canal and by a stream which issues from the Nwala hill over a waterfall. In the earlier years of Mindôn *Min's* reign the Nanda and Aungbinlè Tanks were connected, and when the King constructed roads from Mandalay to his new city at Yankintaung he made allowance for a certain amount of give and take between the northern and southern irrigation systems. The Aungbinlè Lake was about three miles across. After the foundation of Mandalay its chief use was to feed the moat which was the main source of water supply for the town and the only source for the palace and its surroundings. Water not required for this purpose was used for irrigation. **Aungbin[lè] Tank.**

The Tamôkso Tank was dammed by Minshinsaw in 1151 A.D. It was fed from the Nadaunggya *chaung* by means of the Myaungmadaw Canal which took off above the Kyuwun Kyunhla Weir. It was put in good order by Bodawpaya when he founded the first city of Amarapura. **Tamôk[so] Tank.**

The Shwelaung Canal is said to have been dug by Bodawpaya when he repaired the Nanda Tank. It was repaired under the orders of Shwebo *Min* in 1837 A.D. by the Lai Hka *Sawbwa* and the Letwè Winhmu who **Shwela[ung] Canal.**

employed the villagers living along its course. It took off from the Chaungmagyi near Zehaung Village, just above the present head-works of the Mandalay Canal, and ran for about 28 miles, first in a deep cutting along the foot of the hills and then in a south-westerly direction to Amarapura where it had an outlet into the Irrawaddy. Its functions were three (1) to irrigate as much as posible of the land lying between it and the inundated tract, (2) to supply the Nanda Tank and indirectly the Aungbinlè Tank and (3) (after the foundation of Mandalay) to fill the palace and city moats and furnish a supply of drinking water to the town which Mindôn intended to build near Yankintaung. The weir originally constructed across the Chaungmagyi was of the usual type of stone in cribs and appears to have raised the water level in the river about 20 feet. It was always difficult to maintain. Originally it was of moderate dimensions, probably not more than 37 yards from end to end. The action of the flood made it necessary to lengthen the weir annually and in the later years of Mindôn *Min's* reign it measured about 133 yards. If the weir was to be maintained in a useful state, thorough annual repair and, after excessive floods, almost entire reconstruction were necessary. So long as the weir and the dam across the Thapangaing *nullah* were kept in good order, the canal gave a good supply of water, but after the accession of Thibaw organized effort was gradually abandoned. In 1878 A.D. both the weir and the dam burst and threw many thousands of acres out of cultivation. The weir was soon knocked to pieces and swept away; and in 1880 A.D. the supply had failed entirely and the canal was more or less dry except after rain. The Shwelaung was at one time used as a waterway between Mandalay and the quarries and gravel pits of Gandama Hill.

The Dinga *chaung* was constructed in the early sixties of last century. It was thought that the whole of the tract between the Shwetachaung and Shwelaung could not be irrigated properly from the latter; it was therefore proposed to tap the Shwetachaung about two miles below its head and carry the water for 13 miles to the Nanda Tank. Unfortunately the level of the Dinga *chaung* was higher than that of the Shwetachaung and the canal has never been of any use for irrigation, but its bund is used as a cart road in the dry weather.

According to the *Kônbaungzet yazawin* the Shwetachaung Canal was constructed by Bodawpaya (1782-1819

A.D.) and repaired under the orders of Shwebo *Min* in 1837 A.D. Its name (Shwetachaung) is said to have been given because its benefits exceeded those of other canals as the value of gold exceeds those of other metals. It is described as extending from the mouth of the canal on the west of the Paungdawkya Pagoda south to the Letsèkan; and from the Letsèkan south to the Subankan and Tetthein. At the Annexation it was 26 miles in length, with an outlet into the Irrawaddy just below Mandalay Town. The head was on the Chaungmagyi at Kalamet six miles north-east of Madaya. During the dry season a temporary weir was constructed across the Chaungmagyi, but in the rains water flowed direct into the canal. The canal had only one bank and caught all drainage water from the east, as there was no means of regulating the water that came in at the head, the canal frequently breached. The lower section between Madaya and Mandalay was liable to be submerged by the Irrawaddy in high floods and this was also a cause of breaches. Most of the outlets from the canal were constructed of brick masonry. Under Burmese rule the *Yewe-thugyi* or some petty Government official had charge of these pipes and sluices and was responsible for their upkeep, the villagers themselves repairing defects voluntarily. The Shwetachaung remained in working order even during Thibaw's reign and in the early nineties afforded to the land between it and the Myittein *chaung* the best and safest irrigation in the district. The great flood of August 1886 broke through Mindôn's embankment and the Irrawaddy waters poured into Mandalay Town along the bed of the canal.

Myaungmadaw Canal

The Myaungmadaw Canal is said to have been constructed by Bodapaya when he repaired the Nanda Tank. It takes off from the Nadaunggya *chaung* at Sèdaw and at one time irrigated a tract extending on the north-west to the Mandalay-Yankintaung Road and on the south-west to the high land at Nayagan. Its surplus water fell into the Zaunggalaw Tank and thence through the Taungthaman Lake and Sagyinwa Creek into the Irrawaddy. The Myaungmadaw also helped the Shwelaung to feed the Nanda-Aungbinlè tank system. After the break down of the Shwelaung Canal it was expected to do the double duty of filling the Aungbinlè Tank (and indirectly supplying Mandalay with a water supply) and of irrigating several square miles of paddy land, a task for which it was never equal and was not originally intended to perform. It

remained in fairly good order up to the Annexation but in 1891-92 no water was available for irrigation and in 1892-93 the area under *kaukkyi* was about a quarter of the maximum. In 1902-03 a substantial masonry weir was built at Sèdaw in place of the old Burmese dam of loose stones. The greater part of the area formerly irrigated from the Myaungmadaw is now served by the Mandalay Canal.

resent-day rigation om overnment orks.

At present Government Irrigation works comprise the Mandalay Canal which is a Major Canal, the Shwetachaung Canal which is a Minor Canal, and the Taunggan Tank and Myaungmadaw or Tônbo Canal which are Minor Works.* The Mandalay Canal obtains its water from the Chaungmagyi with head works at Sèdaw, sixteen miles north-east of Madaya. It was first opened to irrigation in 1902-03. The capital cost of the project as designed was fifty-one lakhs of rupees, and the actual outlay on it to the end 1921-22 was over fifty-seven lakhs of rupees. The Shwetachaung also obtains its water from the Chaungmagyi ; as designed it had a head at Kalamet six miles north-east of Madaya. Since 1913 a Feeder Cut which takes off from the Mandalay Canal not far above Lamaing, and joins the Shwetachaung at Inpetlet, has enabled the Irrigation Department to divide the water taken in at Sèdaw between the two canals. The Taunggan Tank, eighteen miles north-east of Mandalay, is fed from the Lagyi *chaung* by a canal taking off above the Kyaukse Weir. The Myaungmadaw or Tônbo Canal takes its water from the Nadaunggya *chaung* near Sèdaw Railway Station. The average areas irrigated by these works during the eighteen years from 1905 to 1922 were as following :—

Acres Irrigated.	Mandalay Canal.	Shweta-chaung Canal.	Minor Works.
Paddy	56,940	14,255	2,626
Non paddy	812	2,149	4
Total	57,752	16,404	2,630

(a) Mandalay Canal.

The Mandalay Canal was designed to irrigate 80,000 acres every year. This figure included 15,000 acres on

* A map of the area irrigated from Government works will be found in the pocket inside the back cover.

which it was expected that two crops would be grown. The actual nett area over which it was estimated that irrigation would extend was therefore 65,000 acres. In 1921-22 this figure was attained for the first time, by the cultivation of 65,562 acres * of *kaukkyi* cold weather paddy. The area under *mayin* and *kaukti* hot weather and rains paddy is however still far below the estimate and it is not expected that the project forecast of 15,000 acres for those two crops will be attained so long as water is supplied through the Feeder Cut to the Shwetachaung Canal during the dry months. The length of the Mandalay Canal is 40 miles, and the total length of its distributaries (of which there are seventeen) and their branches is 122 miles. Water-courses are constructed at a charge of Rs. 3 per acre benefited by the Irrigation Department for the cultivators, who are required to keep them in repair. On the 19th October 1913 the Chaungmagyi rose to an unprecedented height, the flood being 13 feet above the highest level recorded previously. The headworks were very badly damaged and the Canal breached in several places. The headworks were reconstructed between 1914 and 1916. Irrigation is almost entirely from the right bank of the canal. The irrigated area was increased after 1912 by the provision of direct water-courses and outlets to irrigate strips of land along the main channel which are not commanded by any distributary. The drainage of water-logged areas also added to the irrigated area. Most of the distributaries of the canal are deep and narrow and their command being none too good they have to be run very full, in order to irrigate satisfactorily. Continuous supplies under these conditions result in considerable waste of water and water-logging of low-lying lands. In 1920-21 after ploughing and nursery waterings for the year had been given, the distributaries were worked on a "Tatil" system, that is to say, they were opened and closed in rotation and when opened were run at their full capacities. The advantages of this system are (1) that the total amount of water used is reduced and it is unnecessary to work the main canal at its maximum capacity which with a short river supply, is a great gain; (2) that the cultivators are obliged to pay more attention to the water distribution instead of leaving the crops untended after transplanting, and (3) that during open periods the water sent down is fully and profitably utilized and during the closed periods the low-lying lands

* This figure was exceeded in 1923-24 when 69,452 acres of *kaukkyi* paddy were irrigated.

have a chance to drain off. The working of the canal on a Tatil system in 1920-21 and 1921-22 had a considerable bearing on the good results obtained in those years though the fact that the condition of the rice market was very favourable to the cultivation of paddy is not to be overlooked. The site selected for the head of the canal and for the weir is the same as that selected by Burmese engineers for the head and weir of the Shwelaung Canal. As originally constructed the headworks consisted of a weir 250 feet long fitted with teak wood falling shutters and under-sluices with four bays, each 31·75 feet wide and a masonry regulator with gates. After the great flood in 1913 the original four bays were replaced by one 80 feet wide fitted with a patent Stoney gate (the largest of its kind in the world) with a lift of 40 feet, and the masonry of the weir crest was raised; while the regulator was rebuilt with twelve openings fitted with gates worked by screw gearing from on top. The bed of the canal runs on a gradual slope of about a foot in a mile and there is only one place where it is broken by a fall of two feet. The masonry of this fall has been utilized to form a bridge on the Lamaing-Madaya Road which crosses the canal at this point. Where there is a sudden change in the level of the country the beds of some of the distributaries are lowered by means of ra pids made of stone instead of the usual vertical masonry falls. Five regulators filled with timber baulks have been provided on the main canal to force the water into the distributaries when supplies are low. The canal crosses a number of orrents and drainage channels, some of which are taken under the main canal by means of masonry syphons, while one is taken over the canal by means of a masonry superpassage and one is taken both under and over. This last is the Thapaugaing *nullah*, across which the canal is taken on a masonry aqueduct with teakwood shutters in place of the usual masonry walls. During ordinary floods all the water in the nullah is passed under the aqueduct, but when the floods are very heavy the shutters are let down and the flood passes both over and under the canal.

An outfall channel has been constructed which will pass water from the nullah direct to the Chaungmagyi from below the aqueduct. A flank bund along this channel will also be built to protect paddy land from floods passing down the channel. In 1923-24, 2,000 acres of *kaukkyi* were left uncultivated owing to these floods.

(*b*) Shwetachaung Canal

At the Annexation the Shwetachaung had a head at Kalamet six miles north-east of Madaya and an outlet into the Irrawaddy just below Mandalay Town. After the Annexation, the Public Works Department took charge of the pipes and sluices and no water was supplied without the permission of the Executive Engineer in charge. During the nineties the canal was much improved by being deepened; its embankments were strengthened and proper sluices built. The main distributary, the Hnèngôkto, was also remodelled in 1898-99. Its length is now 28 miles, with six miles of distributaries. The irrigable area is 26,000 acres, and in 1895-96 the area irrigated was 24,000; but in recent years the canal has been less successful. In 1918-19 only 12,000 acres were irrigated and the average for the eighteen years 1904-05 to 1921-22 is 16,400 out of which 2,150 acres were cultivated with crops other than paddy. The Shwetachaung is used as a waterway as far Obo, and is important as it provides the best means of conveying to Mandalay the produce of the Madaya gardens; within town limits it is practically dry, the water being diverted into the Irrawaddy by a dam and sluice at Obo. There are about forty boats plying on the canal, and the navigation rights are leased for some Rs. 4,000 a year. Before the construction of the Mandalay-Madaya Light Railway on the bank of the Shwetachaung the number of boats was over fifty and the revenue about Rs. 6,000 a year. The slope of the tract irrigated from the Shwetachaung was originally from east to west, but the deltaic action of the Chaungmagyi and Irrawaddy Rivers has formed land which slopes from north to south and from west to east. This has been further modified by the deltaic action of the Myittein *chaung* (flowing from north to south between the Shwetachaung and the main stream of the Irrawaddy) which is really the combined overflow water of the Chaungmagyi and the Irrawaddy. This stream has also built itself up with slopes on either side to the east and west. The cross section of the area west to east is therefore something like this.

In the two valleys on either side of the Myittein *chaung* there are a succession of land-locked depressions which during and after the floods become *ins* or lagoons. The tract is flooded from the Chaungmagyi and Irrawaddy rivers, and from drainage channels crossing the Shwetachaung from the east, *e.g.*, the Lundaung and Kabaing Escapes and the Mingala *chaung*. Large areas are water-logged and rendered uncultivable. At the same time the irrigation system is unsatisfactory. When the Shwetachaung received its water direct from the Chaungmagyi the supply was small in the cold and hot weather and the southern portion of the tract got an insufficient supply. Now the Shwetachaung depends for its dry weather supply on the Mandalay Canal *viâ* the Feeder Cut, which carries enough water to irrigate the whole tract; but the system is so wasteful (it has a duty of only 35 acres per cusec) that the southern area is no better off than before. The Shanmyaung, Kalamyaung and Natpaukmyaung which are distributaries taking off from the main canal are choked with water hyacinth and other plants. Irrigation is difficult and in places impossible without the use of obstructions which eventually make matters worse; and when floods come down, these channels cannot carry enough water, thus causing breaches. The Shwetachaung itself gets badly blocked by the water-hyacinth unless it is kept clear. The Irrigation Department has put this duty upon the lessee of the navigation rights, who in turn puts it upon the boat-owners who use the canal.

Taung-[gan] Tank. The Taunggan Tank was taken over by Government in 1900 A.D. It was filled from the Thapangaing *nullah* and the Kyetmaôk *chaung* by a feeder channel now known as the Yezo Canal. The Kyetmaôk *chaung* flowed directly into the Yezo Canal but the Thapangaing *nullah* was tapped by means of a weir at a point about half a mile below the weir constructed by Government at Kyauksè in 1901. At the same time a head regulator was built in the main canal, and another known as the Kywelebin Regulator in the Yezo Canal. An old channel which connected the new head regulator with the old Yezo Canal was unsilted and a flood escape constructed in the Yezo Canal itself. The tank and its distributary system were not altered. In 1904 north and south distributaries, with head regulators, were built, the bund of the tank was repaired and raised, and an overflow escape was constructed. In 1906 and 1907 four watercourses taking off from the north distributary

and two taking off from the south distributary were constructed at the expense of the cultivators. In 1907 and 1908 were constructed the Myaunggwa and Kinywa Distributaries, with subsidiary works, the object being to irrigate from the Yezo Canal an area which had formerly been irrigated from the Kyetmaôk *chaung* and had now been thrown out of cultivation by improvements to the Yezo Feeder Canal. The area irrigated by the system when it was taken over was about 300 acres. The work done in 1907 and 1908 was responsible for a considerable increase in the area irrigated. The average from 1899-00 to 1908-09 being 839 acres, and from 1909-10 to 1923-24 2,083 acres.

(d) Tônbo Canal.

The Myaungmadaw (Tônbo) Canal is a Burmese work which has been remodelled since the Annexation. A weir was built across the Nadaunggya *chaung* and a head regulator with three openings provided. Two new distributaries (Ngwelaung and Shwezayan) were dug and provided with masonry heads and a regulator across the main canal. Another masonry regulator was also put in a little lower down to distribute water between the old main canal and the Taya *chaung* and to hold up water for the Ôntabin and Tawdwin *chaungs* which take off just above. An open escape was also provided. It was expected that with these improvements 5,000 acres would be irrigated. Actually before 1922-23 the highest figure reached was 1,100 acres. This is probably due to the fact that there is insufficient water in the canal, especially during the nursery and planting periods.

The supply in the Nadaunggya *chaung* is uncertain. During the dry weather there is hardly any water and the stream barely tops the weir. From July to October however there is in normal years sufficient water in the *chaung* to irrigate the tract. One remedy proposed is to enlarge the distributaries in order to take full advantage of floods. Another is to provide water when the river is low by constructing a storage reservoir. Meanwhile minor repairs and improvements to the system as it stands increased the irrigated area to 1,700 acres in 1923-24.

Irrigation from private sources.

Irrigation from private sources is confined to the Singu, Madaya and Maymyo Townships. In the Singu Township there are two tanks, known as the Yenatha and Maungmagan Tanks, which irrigate *kaukkyi* and *mayin* paddy land respectively. The Yenatha Tank is really two tanks, one above the other ; the bunds were repaired and extended in 1920-21 with Government assistance. In a year of

average rainfall it is now possible to irrigate several hundred acres of ***kaukkyi*** paddy below the lower tank, while ***mayin*** cultivation can be practised both within and below the tanks. The bund of the Maungmagan Tank stretches for two miles north-west from Nyaungwun Village. This tank is entirely submerged when the Irrawaddy is at high flood. In 1920-21 extensive repairs were carried out with Government assistance; the irrigation is controlled by *lugyis*, who collect dues on the holdings both within and below the tank. The area of ***mayin*** cultivation dependent on the tank is about 1,400 acres. In the neighbourhood of the Malè and Kadetchin *chaungs*, ***kaukkyi*** paddy is irrigated from channels taking off above temporary weirs thrown across the beds of the streams; and the same method is followed in the east of the Madaya Township, water being obtained from the Lagyi, Sinlu, Ônhlut and Kyabin *chaungs*. These weirs are frequently damaged by the logs of the Bombay-Burma Trading Corporation, which are floated down the streams during a rise. In the Maymyo Township there are a number of petty canals taking off from the Gèlaung *chaung*, the Kyettet *chaung*, the Chaungmagyi, the Sinlan *chaung* and other streams. In the large streams deposits of calcareous tufa are found where percolating waters come to the surface. They take the form of dams or natural weirs extending across the river from bank to bank and advantage is taken of them to construct irrigation channels. Elsewhere the weirs are temporary structures of stakes and loose stones.

CHAPTER V.

FORESTS AND MINERALS.

Area of Forests; Administration; Legal position; Class of Forests; Forest Produce; Revenue and Expenditure; Staff; Revenue Stations; Regeneration; Keddahs; Minerals; Sagyin Stone Tract; Rubies; Marble; Road-metal and Building stone; Lime burning; Iron-stone.

Area of Forests. Of the 2,131 square miles of the Mandalay District reserved forests occupy 609 square miles, while a further 124 square miles are undergoing settlement at the present time. There are also 860 square miles of unclassed forests leaving a balance of 478 square miles without tree growth.

Administration.

The boundaries of the Maymyo Forest Division coincide with those of the Mandalay District; there is also a Depôt Division in Mandalay. The jurisdiction of the Depôt Division comprises Mandalay Town and the control of the transport of Forest produce along the Irrawaddy river from Kyaukmyaung as far south as the upper mouth of the Chindwin. This Division conducts the measuring and passing for revenue of all lessees' teak logs extracted from districts up stream from Mandalay and also from the Northern Shan States and the northern part of the Southern Shan States. It also controls all saw-mills, saw-pits, and drift in Mandalay and outstations within two miles of the river banks within its jurisdiction. It checks all Forest produce brought into Mandalay town by rail or road. The Division acts as an agent for other Forest Divisions in many ways.

Legal position.

The following are the reserved forests in the Maymyo Division with their particulars :—

Name of Forest.	Area in square miles.	Number and date of Notification constituting forest.
Upper Madaya ...	59	No. 366, dated 13th August 1896
Chaungthabaw	33	No. 62, dated 17th February 1897
,, Extension	19	No. 16, dated 3rd February 1919
Kadetchin ...	48	No. 63, dated 17th February 1897
Lower Madaya	112	No. 65, dated 17th February 1897
Singu ...	40	No. 333, dated 25th September 1901
Kywetnapa ...	17	No. 41, dated 2nd March 1898
Zinbingyi-Tônbo	11	No. 349, dated 1st October 1901
Ywathit ...	36	No. 595, dated 15th December 1904
Sakangyi ..	38	No. 457, dated 19th September 1905
Maymyo ...	35	No. 47, dated 20th March 1908
Taungbyo ... } Taungbyo Extension }	33	No. 43 dated 21st February 909; No. 215, dated 5th September 1914
Baw .. } Baw extension .. }	126	No. 238, dated 1st December 1911; No. 99, dated 15th May 1914
Taunggyun ...	62	No. 227, dated 15th November 1922

Areas at present under settlement are :—

Singu Extension	30	square miles.
Kadetchin extension	31	,,
Lower Madaya Extension ...	62	,,
Sakangyi Extension	1	square mile.

This will complete reservation in this Division.

Class of Forest.

The above forests may be divided into two classes; those of low altitude between 200 and 1,500 feet above sea level, where teak, *pyinkado* and other hard woods are to be found; and upland forests, whose altitude is between 2,000 and 4,000 feet growing a drier evergreen type of trees such as the local species of oak and chestnut. The Upper and Lower Madaya, Kadetchin, Singu and Ywathit reserves fall in the first category. Within them the principal species found are teak (Tectona grandis), *pyinkado* (Xylia dolabriformis), *in* (Dipterocarpus tuberculatus), *taukkyan* (Terminalia macrocarpa), *pyinma* (Lagerstrœmia Flos Reginæ) and *sha* (Acacia Catechu). Other trees found are *yindaik* (Dalbergia cultrata), *kanyinbyu* (Dipterocarpus alatus), *padauk* (Pterocarpus macrocarpus) and *yemane* (Gmelina arborea). Maymyo, Taungbyo, Baw, Sakangyi, Zibingyi Tônbo, Chaungthabaw, Kywetnapa and Taunggyun reserves are of the high altitude type of forests. The principal species of trees found within them are *thite*, *thitegôn* and *thitcha* (Quercus serrata, spicata, fenestrata, Griffithii Helferiana, Lindleyana, Castanopsis tribuloides and argyrophylla.) Other trees occurring are *thitni* (Wenlandia paniculata), *laukya* (Schima Wallichii and Noronhæ), *bonmeza* (Albizzia stipulata), *thitmagyi* (Albizzia odoratissima), *sibyu* (Phyllanthus Emblica), *pebôk* (Callicarpa), *yemein* (Aporosa), *ondôn* (Litsæa), *thitsi* (Melanorrhœa usitata) and *thitya* (Shorea obtusa). A small patch of indigenous pine forest (Pinus Khasya) exists on a hill about 12 miles east of Maymyo. Besides teak, the trees yielding the most valuable timber are *padauk* and *pyinkado*; *thitya*, *ingyin* and *in* are also employed in building. The other trees of economic importance are *sha* yielding the cutch of commerce; the *thitsi* producing a black varnish; and the various species of *shaw* (Sterculia), the bark of which yields a strong fibre.

The Ywathit, Singu and Upper Madaya reserves lie between the Irrawaddy and the Upper waters of the Chaungmagyi (which forms the eastern boundary of the district in the Singu township), their northern boundaries coinciding with the northern boundary of the district. South of Upper Madaya reserve are the Kadetchin reserve and the Lower Madaya reserve, the former on the west and the latter on the east, its eastern boundary bordering the Chaungmagyi. The southern boundary of the extensions of these reserves comes to the foot of the hills immediately north of the Chaungmagyi after it turns due west

at Sèdaw. On the east bank of the river above this bend lies the Chaungthabaw forest, part of it forming the apex of the Maymyo Subdivision. The Taungbyo reserve encircles the town of Maymyo on the north and the Maymyo reserve is similarly situated to the south of the town. The Baw reserve lies in the south eastern corner of the Maymyo subdivision, its southern boundary following the course of the Myitngè or Namtu river, as far west as Lema. The Kywetnapa reserve lies in the south-western corner of that subdivision between the Myitngè and the Maymyo road, while the Zibingyi-Tônbo reserve lies north of the road, its western boundary being the same as that of the subdivision. North again of this lie the Taunggyun and Sakangyi reserves, roughly east and west of the sub-divisional boundary, though a portion of the former lies within the Maymyo subdivision. Two areas along the Maymyo road, south and east of the Sakangyi reserve are areas under Rule 28 of the Forest Rules while the area immediately round Maymyo, not included within the reserves, is under Forest Rule 27.

Forest Pr[oduce].

The Bombay Burma Trading Corporation possesses leases for the extraction of teak in the Singu, Upper and Lower Madaya and Chaungthabaw reserves. Hardwoods are worked by local Burmans, Indians and Chinese in the Ywathit and Sakangyi reserves. Licenses for bamboo extraction are granted in the Ywathit, Singu, Madaya and Sakangyi forests and bamboos are also extracted from unclassed forests, though the latter are nearly exhausted. Departmental extraction of firewood is carried out in Maymyo reserve. Lac is worked in the Maymyo reserve by a licensee under a profit sharing agreement with Government. In other parts of the division the right to collect lac is licensed. This, however, will cease this year when all lac, except in the Maymyo reserve, will be collected departmentally. A few licenses are also issued to collect *shaw* fibre, *thitsi*, *damma*, *tanaung* bark and bats' guano.

The Bombay Burma Trading Corporation employs elephants to extract the teak, the logs being then floated down the Chaungmagyi or Myitngè rivers. In the case of the Chaungthabaw reserve it has recently constructed a trolley line from near Kyauksè (not the district head-quarters of that name) to Ôkpo on the Chaungmagyi to facilitate extraction from the southern end of that reserve. The local contractors employ buffaloes and carts for

extraction. No unclassed forest is of any commercial importance.

The outturn of timber and revenue derived therefrom for the last five years in the Maymyo forest division is given below. In the case of teak the lowness of the figures for 1921—24 in the Maymyo Division and the corresponding increase in the figures of the Depôt Division is accounted for by the fact that part of the revenue appears in the figures for the latter Division. An experiment was made during these three years in crediting to the Depôt Division the revenue derived from all logs measured by that Division irrespective of the Division from which they were extracted. As it was found inconvenient for the purposes of the Annual Report and the Budget the experiment was discontinued :—

Year.	Teak. Volume in tons.	Teak. Revenue derived. Rs.	Hardwoods Volume in tons.	Hardwoods Revenue derived. Rs.
1920-21 ...	5,609	1,07,882	2,368	11,015
1921-22 ...	321	6,261	2,040	8,894
1922-23 ...	6	115	2,485	23,046
1923-24 ...	66	1,225	1,824	7,930
1924-25 ...	6,481	1,15,072	1,897	8,442

Firewood.

Year.	Volume in cubic feet.	Revenue derived. Rs.
1920-21 ...	198,316	9,807
1921-22 ...	342,898	20,035
1922-23 ...	415,654	31 463
1923-24 ...	241,107	17,650
1924-25 ...	410,955	30,704

The firewood when extracted is sold to retailers in Maymyo town, to the Burma Railways and to the Maymyo Electric Light Company. A small quantity is occasionally sold to lime burners.

Revenue and expenditure. The figures for revenue received and expenditure incurred for the last five years is given below :—

Maymyo Forest Division.

Year.	Revenue. Rs.	Expenditure. Rs.
1920-21 ...	1,62,681	1,15,122
1921-22 ...	57,886	1,00,358
1922-23 ...	1,02,980	1,30,359
1923-24 ...	67,148	1,41,514
1924-25 ...	1,99,078	1,69,316

Depôt Division.

Year.		Revenue.	Expenditure.
1920-21	...	2,33,865	1,00,595
1921-22	...	26,91,647	1,45 744
1922-23	...	17,48,500	1,18,417
1923-24	...	18,08,341	1,13,243
1924-25	...	3,90,227	1,34,671

Staff. The Maymyo Forest Division is in the charge of a Deputy Conservator of Forests, usually assisted by an Assistant Conservator. The headquarters are at Maymyo. The subordinate staff consists of 6 Forest Rangers, 4 Deputy Rangers, 18 Head Foresters and 39 Foresters.

The Depôt Division is in the charge of a Deputy Conservator of Forests with a gazetted officer as Assistant. Two or three Assistant Conservators are attached each year for about six months for timber-measuring duties.

Revenue Stations. There are three revenue stations in the Maymyo Forest Division, situated at Singu, Madaya and Môndaw. The latter is a village on the Myitngè.

Regeneration. Regeneration of teak is carried out in the Lower Madaya, Ywathit and Sakangyi reserves. Concentrated regeneration of Eucalyptus species by the *taungya* method was begun in the Maymyo reserve in 1922 when 103 acres were planted with these trees. The experiment is achieving a fair success and a further area of 71 acres was planted in 1923. These areas will be retained as an experimental area, as it is proposed to plant 150 acres annually in the future.

Keddahs. There are two keddah operators holding licenses in the division. During the years 1920—23 an average of 31 elephants were captured annually, but during the past two years the numbers captured have decreased to 13 and 4 respectively.

Minerals. The only mineral of any commercial importance in the Mandalay district is limestone in its various forms. As marble it is worked for statuary purposes; the harder varieties are quarried for road metal and building stone and the pure variety is burnt for lime. Rubies and spinels are found in conjunction with the marble but not in any large quantities; plumbago and graphite also occur in the same locality but are not worked on a commercial scale. Ironstone is worked on a small scale near Wetwun by the Burma Corporation and used as a flux for smelting at Namtu. Copperas and argentiferous galena are known to occur in the hills west of Mandalay but are not of any economic importance. Mica has been found at Shwegyin

in the north of the Singu township and a very indifferent lignite occurs at Wetwun.

Sagyin Stone Tract.

The Sagyin Stone Tract where the marble and rubies are found is situated 21 miles to the north of Mandalay and consists of an isolated range of small hills running north and south in the alluvial plain of the Singu Township, the southernmost and highest hill, 808 feet high, rising from the right bank of the Chaungmagyi river a few miles from its confluence with the Irrawaddy. It is composed of seven small hills of which four lie to the north and three to the south of the village of the same name.

The mines which have been worked for many years were in active operation in the time of King Mindôn, who is said to have obtained rubies worth Rs. 30,000 in one month from the Royal mine which is situated in the northern portion of the hills.

In 1890 a portion of the hills was declared a stone-tract and all work was prohibited; subsequently, however, licenses to work marble were granted and a considerable amount of illicit ruby mining was carried on at the same time. In 1898 the rules were revised and licenses carried with them the right to mine for any kind of stone. A distinction was made between those who at that date could prove themselves to be "hereditary marble workers" and newcomers, the former paying a fee of only Rs. 5 per annum while the latter were required to pay Rs. 10 per mensem. These licenses are issued by the District officials and carry a proviso that no machinery, but only native methods are to be used.

These hills consist of limestones and gneiss with a vein stuff consisting of an earthy matrix in which are imbedded the various minerals weathered out from the limestone. This weathered material has been deposited in the cracks and hollows of the limestone where it has become consolidated; it has in turn undergone weathering and has become soft and disintegrated; it can be dug out and, on washing, readily yields its contained minerals.

The limestone varies from a pure white saccharoid marble to an aggregate of coarse crystals 3 or 4 inches across; the colour varies from white to a pronounced bluish grey colour. It frequently contains accessory minerals such as a yellow mica, chondrodite, biotite, augite, scapolite, graphite, spinels of various colours and rubies. The gneiss is found in the southern portion of the hills only and in some places contains small quantities of graphite.

Mining for rubies is carried on by two systems. In the first the vein stuff is dug out and then washed in flat baskets through which the fine debris escapes. The larger fragments are retained by the basket and are carefully picked over. Rubies.

The second method of mining is that of quarrying the gems out of the unweathered rock. By means of fires great slabs of the rock can be split off and then broken up by hammers. The small pieces are then scrutinised and the adherent gems are detached as carefully as possible. By this method, however, the rubies rarely escape fracture. In recent years the vein stuff has been almost worked out and the yield of rubies has been small.

The chief industry carried on today is marble quarrying; the rock occurs in great purity at the summit of the southern and largest hill, called Kalamadaung, and is there quarried to a considerable extent. The white marble is extracted in large blocks by means of wedges driven in the veins; the blocks are then rolled down the hillside to the foot of the hill. Here the marble is roughly chipped into the shape of an image of Buddha, and is transported *via* the Chaungmagyi by raft to Mandalay to be finished. In the dry weather the rough images are carted to Mandalay. Some statues are finished on the spot, but the best workmanship is to be found among the carvers at Mandalay who live in the quarter west of the Arakan pagoda. Demarcation pillars and tablets for inscriptions are also made in fairly large numbers from this marble as well as a few statuary figures such as *bilus*, elephants and the like, but the great bulk of the marble is carved into images of Buddha, which are despatched to all parts of Burma. Marble.

All the purer and whiter rock is used for this latter purpose, and is capable of taking a high polish which is produced by rubbing with a variety of sandy claystone obtained from the Sagaing Hills. No statistics are available of the quantity of marble extracted yearly, but the amount appears to be comparatively small and large quantites still remain. In 1924, the number of "hereditary workers" who had renewed their licenses was 16, while 68 names still remained in the register. No licenses to non-hereditary workers appear to have been issued during the past few years.

Limestone is extracted for road metal and building purposes from the Mandalay Hill and the other isolated hills in the Mandalay plain, Yankintaung, Ngamundaung Road m[etal] and buil[ding] Stone.

and Ingyin Hill. It is also quarried at Tônbo on the Maymyo road and further east at the 16th mile and again at Yemeye near Zibingyi where the red Nyaungbaw limestones occur. The latter were used for copings and ornamental string courses in the construction of the Rangoon General Hospital. At Maymyo and at another village of Tônbo in the vicinity of Maymyo limestone is also extracted. In 1924, 38,312 tons of limestone valued at Rs. 84,118 was raised in the Mandalay district for the abovementioned purposes besides 4,980 tons of granite and 6,484 tons of gravel both from Mandalay Hill, valued at Rs. 5,602 and Rs. 3,457 respectively.

-burn- Limestone is burnt for lime at various places within easy reach of the Maymyo Railway wherever lime-stone with a low magnesium carbonate content occurs. Tônbo at the foot of the hills is a small lime-burning centre and there are groups of kilns near Zibingyi, Letpangôn, Singaung, Dôkwin, Yegyano and Wetwun. At Zibingyi little cultivation is carried on, the whole village being occupied in a lime-burning industry. A family can work 3 or 4 kilns, 3 burnings a month being the maximum possible at each kiln; the average is however about one burning a month per kiln, all the year round The cost of quarrying the limestone, cutting fuel, packing and tending the kiln and carting the lime to the railway is about Rs 90 per burning. About 11 tons of lime (one railway truck) is produced at a burning and this sells for Rs. 120 to Rs. 140 Each kiln consumes about 250 tons of firewood a year. There are over 150 kilns in the district. These localities supply nearly all the lime used in Upper Burma and probably 500 households are engaged in the industry. Fifteen thousand tons of lime are shipped by the Railway annually from Zibingyi.

-stone. Iron ore is to be found in the Naungkangyi sand-stones and is carted from various localities to the Burma Corporation's iron-stone dressing plant situated at a siding at mile 430 of the Lashio Branch of the Burma Railways. From there it is sent to Namtu for use as a flux in their furnaces. The ore is raised and brought by cartmen working at contract rates from Pauktaw, Bawhlaing and Naungthakaw to this spot About 140 persons are supported by this industry and in 1924, 328 tons of the ore valued at Rs. 328 were raised.

CHAPTER VI.

OCCUPATIONS AND TRADE.

Classification of People by Occupation; Factories; Village Industries; Silk Weaving; Pottery; Goldleaf Industry; Paper-making; Jade; Amber; Trade Routes; Trade with the Shan States; Bazaars.

Classification of people by Occupation

A census of the population of the Mandalay District, has been taken four times since the Annexation, in 1891, 1901, 1911 and 1921. In 1891 and 1901 the same classification by occupations was adopted but in 1911 a new system was introduced and this was again slightly varied in 1921. The following summary, however, shows the number of persons dependent on different occupations for their livelihood as returned in these four censuses.

Occupations.	1891		1901	
	Number.	Percentage	Number.	Percentage.
1. Service of Government.	11,173	2·9	13,752	3·7
2. Pasture and Agriculture.	92,060	24·7	89,466	24·4
3. Personal Service ...	6 665	1·8	12,164	3·3
4. Preparation and supply of material substances.	166,081	44·4	155,567	42·5
5. Commerce, Transport and Storage.	18,753	5·0	23,452	6·4
6. Professions	22,512	6·0	21,901	6·0
7. Indefinite and Independent.	56,784	15·2	50,204	13·7
Total ...	374,028	100·0	366,507	100·0

Occupations.	1911		1921	
	Number.	Percentage.	Number.	Percentage.
1. Exploitation of the surface of the earth.	130,998	38·5	...	...
1. Production of raw materials.	...	...	140,656	39·5
2. Industry ...	54,763	16·1	74,923	21·0
3. Transport ...	22,664	6·7	22,587	6·3
4. Trade ...	63,746	18·7	57,646	16·2
5. Public Force ...	10,249	3·0	8,369	2·3
6. Public Administration.	4,636	1·3	3,639	1·0
7. Professions and Liberal Arts	12,963	3·8	17,533	4·9
8. Persons living on their income.	742	·2	1,602	·5
9. Domestic Service	7,125	2·1	7,265	2·0
10. Insufficiently described.	30,756	9·0	18,213	5·1
11. Unproductive and unclassified.	2,128	·6	4,188	1·2
Total ...	340,770	100·0	356,621	100·0

ctories.

With the exception of three small water mills near Wetwun rice-milling is concentrated in Mandalay Town where there are over 20 mills; nearly all owned by Burmans or a syndicate of Burmans who have subscribed the necessary capital between themselves. In one or two cases the mills are worked partly as rice mills and partly as saw mills. In 1921 Mr. H. O. Reynolds, I.C.S., held an enquiry into the condition of the rice milling industry in selected districts, including Mandalay, on which he noted as follows :—"Rice-milling in Mandalay is of long standing and there is always considerable local demand. The *taung-deik-pan* paddy from the Mandalay irrigation commands a big price, much greater than the *mogaung* paddy from Katha which mills into what is called *ngaseingale* rice. Mandalay supplies the town and the riverine areas of the dry zone. Milling for the latter is more or less confined to half a dozen of the larger mills which purchase largely from Katha. The smaller mills confine themselves to *taung-*

deik-pan for the local market. Many of them mill for hire only. . . . . . . The best days of rice-milling in Mandalay are over, owing to the gradual cutting off of the Shwebo supplies of paddy. The canal irrigated paddy in the Mandalay District will always be available and the local demand for rice must remain considerable, but the mills are already too numerous even for this, while the prospects of the larger mills exporting down the river are poor unless they can retain at least the Katha paddy supplies."

There are about 20 saw mills in Mandalay Town and also two which are worked by water near Maymyo. Other factories include oil-mills, printing presses, ice and aerated water factories, a brewery, a match factory and workshops and foundries such as those of the Government and the Irrawaddy Flotilla Company in Mandalay, and of the Burma Railways at Myitngè.

Village Industr[ies]

In 1921 Mr. W. F. Grahame, I.C.S., made a detailed enquiry into occupations in the Mandalay District. He recorded statistics of the numbers of families engaged in 58 different main occupations and also in a number of subsidiary occupations. The most important main occupations (excluding agriculture) are silk weaving, wood workers (including house builders, cabinet makers, boat builders and cart makers), fishermen, tailors, shoemakers, basket workers, masons, blacksmiths, goldsmiths and silversmiths, brass workers, marble sculptors, potters, gold-leaf workers, gold embroidery workers and umbrella makers. Subsidiary occupations followed by those engaged in agriculture or some other main occupation include cotton weaving, rope weaving, and cigar rolling. Silk weavers are found mainly in Amarapura and the surrounding villages, and potters in the south-west corner of the District. The other occupations are almost entirely concentrated in Mandalay Town. A list of the occupations with the number of the families engaged in each, together with a full description of some of the more important or interesting industries will be found in Mr. Grahame's Note on his enquiry which appears as Appendix C to Part I of the Census Report (Burma) 1921. That note should be read with this Chapter as the industries there described have not been dealt with here unless further information has since become available. The lime burning industry in the Maymyo Subdivision and the marble and ruby industries of the Sagyin Hills are dealt with in Chapter V.

The Silk weaving Industrv in Amarapura and surrounding places is very important. The demand for Burmese silks for *lôngyis*, *pasos* and jackets over the whole province is supplied to a great extent by the silks woven in Mandalay District. There are more silk weavers in Amarapura and surrounding places in the Mandalay District than the rest of the silk weavers in the whole province put together.

Silk weaving in Mandalay District is a very old industry but impetus seems to have been given to it by the Manipuris who were brought from Manipur as war captives by the Burmese King about 50 years ago. They appear to have introduced some improvements such as beaming of warps, etc. Even now there is amongst weaver si n Amarapura a large section of these Manipuri weavers or their descendants known as Kathès.

Though silk weaving is so important an industry in Burma it has to depend for its raw material, silk (yarn), from China. Attempts are being made by the Agricultural Department to produce silk in Burma. It will, however, take some time before all the silk required could be produced in this province. The silk which is imported in Burma and used by silk weavers is in two varieties: the twisted (ဘာကြိမ်) and the untwisted (ဘာဋ). The twisted silk is stronger and is generally used for warps (lengthwise threads in cloth) on account of its strength, evenness and smooth feel. It is often used for weft also (breadthwise threads) in better varieties of silks. The untwisted silk is full of loose fibres and therefore produces silk of rather rough and uneven surface which in some well-woven silks, though not apparent in the beginning, is visible after some wear. Being cheaper in price it is generally used for weft purposes where strength of yarn is not of so much consequence. There is generally a difference of Rs. 15 to 20 per viss between the twisted and the untwisted silk. Owing to this high difference in price the untwisted silk is now often twisted locally and used for warp purposes. But this twist is not even and the locally twisted silk is not therefore so good as the imported twisted silk. After the raw silk is purchased from the market it undergoes the following processes till it is woven in cloth.

(*a*) Boiling or degumming (ပိုးပြုတ်ပြင်း။). Raw silk contains about 25 per cent. natural gum which has to be removed before it is fit to be dyed or woven in cloth. This is done by boiling the silk in a solution of soap and sand

soap for about 5 to 10 minutes. The silk then becomes white and gets the silky feel and lustre.

(*b*) Dyeing (ပိုးဆိုးခြင်း။). Unless the silk is to be woven white (in its natural colour) it is dyed in the shade required. Excepting one or two shades, aniline colours are used for dyeing. They are used because of their cheapness in price and ease of handling. The only vegetable dyes used are Arnatto seeds and Shan tea which produce beautiful orange and coffee coloured shades.

(*c*) Winding (ချားလှည့်ခြင်း။). The silk is then wound from hanks on to bobbins. This is done in order to facilitate the subsequent process of warping. The bobbing spindle (the rod on which the bobbin is inserted) is generally turned by hand, though it can be done more efficiently by means of pulleys.

(*d*) Warping (ချားပုတ်ခြင်း။) In this process the number of threads required to make the width of the cloth are assembled. A number of bobbins wound in the former process are put in a creel and all the threads from these (a thread from each bobbin) are wound round a big reel called a warping mill, up and down the reel in a spiral form. The number of bobbins put in the creel multiplied by the number of the up and downwards turns of the reel will give the number of total threads in the warp and the number of rounds of the reel multiplied by the circumference of the reel gives the length of warp. The warp is then prepared in a rope form of required length and with the necessary number of threads to make up the required width.

(*e*) Beaming (ထဘွိုးလိပ်ခြင်း။). The warp is then spread in an open space. The threads are evenly distributed over a roller called a warp beam and wound on it with uniform tension.

(*f*) (1) Drawing in (တော်ဖီတော်ခြင်း။). The threads are then drawn through healds. Each individual thread is drawn through an eye of a heald. This has a double object. One is that threads are controlled in raising and depressing through these healds; when a heald is raised or lowered all threads drawn through it are raised or lowered. The second object is to obtain a pattern. The order in which threads are drawn in healds and the order in which these healds are raised or lowered form the pattern.

When one warp is finished and the pattern for the next warp is to be the same, the threads of the new warp are

sometimes simply joined with the last ends of threads of the old warp on the loom.

On Burmese looms the healds are knitted on the threads instead of these being drawn through the healds.

(2) Reeding (ထင်းသွားသွင်းခြင်း။). The threads after being drawn in healds are drawn through the reeds. Invariably two threads are drawn through one dent (one slit) of the reed. This is done in order to lay the threads in a uniform distribution in the cloth. It has other objects also. On Burmese looms this process procedes the beaming.

(*g*) Gaiting (ထဆွင်း ပင်ခြင်း။). The warp after undergoing the previous processes is taken on the loom. The warp beam is put in brackets at the back of the loom and the threads with the healds and reeds are brought to the front and tied to a piece of bamboo or the ends of a cloth temporarily wound round the cloth roller. The threads are thus kept tight. The healds are then attached to the rollers or pulleys at the top and to peddles at the bottom according to the pattern required.

(*h*) Pirning or spooling (ထက်စေါက်ခါရက်ခြင်း။) This is a process for winding the thread used as weft on to spools put in a shuttle. It could be done directly from a hank but is generally done from bobbins on which is wound yarn from the hank (process 3) thereby involving one more process. It is done in order to facilitate the winding and to make the tension more even than is possible by winding direct from hanks.

The silk is now woven with the warp prepared in processes from (*a*) to (*g*) and the weft prepared in process (*h*).

Though the silk weaving industry is so important and old, it was till recently solely carried on in primitive ways, with throw-shuttle looms on which the shuttle is thrown from hand to hand. This necessarily yields cloth of narrow width, as for wider cloths the weaver has to make sideway movements to catch the shuttle on the other side which is very exhausting. The production obtained on Burmese looms is low and yields a poor return to the weaver. The average income of a weaver working on a Burmese loom is from 10 to 15 rupees per month.

The important feature in the improved looms introduced * by the Saunders Weaving Institute is the automatic shuttle-throwing attachment whereby the shuttle is thrown

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* For an account of this Institute, see Chapter IX.

from one side to the other by giving a push to the sley. It is therefore possible to weave wider cloths on these looms with no strain on the weaver. The production on these can be increased two or three times more than is possible on the Burmese looms. There is also the advantage of getting cloth of double width. Consequently the economic condition of weavers is much improved by working on these looms. The average income of a weaver working on an improved loom is about Rs. 30 per month.

The weavers in the Mandalay District may be divided into two chief classes :—

(1) Weavers who work on their own looms independently. They make their own purchases independent of any financier. These may be subdivided into (*a*) those who possess one loom only and work on their own loom and (*b*) those who possess more than one loom and engage weavers for the extra looms.

(2) Weavers who work for financiers ; these may also be subdivided into two :—

(*a*) Those who receive silk (thread) from financiers and after weaving it (generally in their own homes) into cloth return it to them. They get their wages for weaving according to the piece-work system.

(*b*) those who do the weaving only, generally in work-sheds, on piece-work The other processes are done by financiers.

The system of payment in vogue in Amarapura and surrounding places is the piece-work system. The daily wage system is not usual.

The state of the weaving industry in general is improving. The economic condition of weavers has improved to a great extent during the last five or six years. The average income of a weaver prior to that time was below ten rupees. At present it is Rs. 15 for those who work on indigenous looms and Rs. 30 for those who work on improved looms. The number of looms, especially of the improved pattern, has also increased considerably during the last five or six years. The production of silk cloth is on the increase as evidenced by the increase in imports into Burma of silk thread.

The pottery industry is localised in the south-west corner of the district in the villages of Tatkyi, Seobo and Letthit, but is also found in Ketthin near Singu and to a small extent in the Obo Quarter of Mandalay Town. Except in Letthit the pottery made is the ordinary red variety. **Pottery.**

Seobo specialises in kettles and tea-pots but Tatkyi, Ketthin and Obo are almost entirely devoted to cooking-pots. A special line of bright-coloured pottery—yellow, green, blue or red—chiefly in children's tea-sets is made at Tatkyi for sale every year at the festivals of the Brother *Nats* at Taungbyôn and Amarapura.

Tatkyi is the most important centre of the red pottery industry. The earth is brought over from Kinlat in Kyauksè district. A boat load of 60 *kwetwintaung* sufficient to make about 2,000 pots of assorted sizes costs Rs. 5. This earth is first dried and carefully sifted, then it is mixed with water and sand and made up into lumps (*taung*) of clay (*shun*). For this operation a cooly gets one pice per *taung* and can earn six to eight annas a day. A lump of this soft clay is given a rough shape on the potter's wheel (*set-pyin*). This is allowed to harden and the walls of the vessel are then beaten between two pieces of wood, an anvil and a beater. The beater is paddle-shaped, somewhat like the "butter hand" used in English dairies and is marked with various patterns which are thus impressed upon the pot. This beating compacts the clay, thins the walls and enlarges the size of the vessel. This process is continued until the final shape is reached, a shape which depends for its regularity on the skill of the potter, on his—or more often her—accuracy of eye and hand. After further drying the pots are baked for 24 hours in batches of 500 (*ta-pôk-sa*), the fuel used being wood, straw and dried cattle dung. Fuel for one firing costs Rs. 5 and four men are required at annas eight each. There are three standard sizes of pots known as *Pyewin*, *Kwetwin* and *Salèwin*. The same process is followed at Ketthin and Obo and in the making of kettles at Seobo except that in none of these places is sand mixed with the earth. The spouts, handles, etc., of the kettles are made separately and joined on to the vessel after it has been beaten into shape but while it is still soft. The profits of the industry are small and the potters do not appear to be prosperous.

The black pottery industry of Letthit is more flourshing. The chief article made is the *pôngyi* bowl; but vases, candle-sticks and other ornaments are now made in considerable quantities. The earth is obtained within the village-tract and for bringing in a cartload of 20 *kwetwintaung* a man receives annas 12, annas 4 for the digging and annas 8 cart hire. The process is similar to that described above and varies only in the degree of perfection aimed at and

obtained. The earth is first dried and sifted, then mixed with water (but no sand) carefully sifted again and spread out in the sun to dry. It is now called *Mye-pyin*. When it is sufficiently dry a rough shape is modelled on the potter's wheel. This is called a *Thaleiklaung*. Then, as described above, with beater and anvil the potter hammers out the walls of the vessel gradually compacting and compressing them and at the same time enlarging and shaping the bowl. This process is repeated two or three times with intervals to allow the clay to stiffen. The result is a bowl with walls a quarter of an inch thick and remarkably true to shape. This is called a *thabeiklôn*. When the clay has sufficiently hardened the bowl is scraped (*chit thi*) by the craftsman with a metal scraper until the walls are only about an eighth of an inch thick.

When the bowl is fairly hard it is polished (*hmwe-thi*)—by a woman generally—with a smooth pebble or *gônyin* seed and a little earth-oil. Then after a day's interval it is rubbed over with paraffin and sesamum oils. The result is a beautiful thin-walled bowl of rich brown. After another day's interval for drying, the bowls are baked for 24 hours in a kiln in batches of 550. The black colour is obtained by introducing some earth-oil into the furnace after the bowls have been baked and while they are at a high temperature. For vases and other articles the process is similar but the final shaping is given to them on the wheel and not later on by hand.

In his address at the Arts and Crafts Exhibition in 1918 * Mr. A. P. Morris said of this black pottery:—"It is capable of considerable development and as a special ware might find a good deal of encouragement if the potters would develop their output to suit modern needs. Looking at this ware, one is reminded of ancient Greek black pottery. The coloured design is not there but it could doubtless be added. It is probable in any case that the method used in obtaining the black surface is similar." In a subsequent note he added:—"The process used in the manufacture of old Greek red figured black pottery has also received attention and starting with Letthit black ware, various processes have been tried. Red-figured wares have been successfully produced and it is believed that the lost process of the Grecian red-figured black pottery has been re-discovered. It is hoped that ere long the Letthit potters

* Burma Research Society's Journal, December 1918.

will be able to produce a Græco-Burman art ware." This hope, however, has not yet been fulfilled.

oldleaf dustry.

The goldleaf industry is mainly carried on in the Myetpayat Quarter of Mandalay. The gold is first tested on a touch-stone and refined. It is then melted and made into little sticks. This stick is put into a stretching machine and then beaten out by hand until it is several feet long, about an inch wide and flat. This strip is then cut up into little squares. Each square is put between layers of paper—a piece of gold and a strip of paper alternately—and these are made into bundles which are wrapped in skin and beaten out with mallets until each piece is about six times its former superficial area. Each piece is then cut up again into six pieces, similar bundles are made up, and the beating is repeated. This process is continued until the gold-leaf is beaten out thin enough. It is then made up into squares placed between sheets of paper and made up into bundles of 99. These bundles are sold for Rs. 3 to Rs 5. The bundles are generally made up by young girls and the beating is done by men. A more detailed account of the industry may be found in Mr. Grahame's Report referred to above.

aper aking.

Paper making is mainly carried on in Mandalay Town near China Street. The industry was introduced by Siamese who were followed by Shans—from whom the present craftmen are probably descended, though they call themselves Burmans. The paper is made out of bamboo (*my'n-wa*, which is brought down from the hills about the month of Tazaungmôn. This paper is only used for packing goldleaf. The bamboo is first soaked in water, lime equal in quantity to the bamboo being mixed in. When the bamboo has disintegrated into fibres it is beaten out with wooden mallets. It takes about 10 to 15 days to beat out one fifth of a viss of fibre. This pulp is then subject to a further beating with the horn of a *thamin* until it becomes rather like paste. This is then mixed with water in a pot the mixing being done with a kind of "swizzle stick." This mixture is then poured on to a canvas frame (which is placed on the top of a shallow tank of water so that it is just awash) and carefully smoothed and rolled to ensure the equal distribution of the fibre. The frame is then raised slightly so that the mixture can dry as the water drains through the canvas. The edges dry first and the canvas is gradually raised until it is clear of the water. It is then left for about 15 minutes until it

is quite solid and is then put in the sun to dry. When it is quite dry the paper is peeled off the canvas frame, and cut into pieces of the required size. These pieces are then glazed by beating them on a slightly convex brass slab. This operation is performed by women and is usually done in an underground room. The reason for doing this underground is said to be to avoid the wind and dust. When they are finished these pieces are made up into sets of 950 and sold for about Rs. 125.

Jade. All jade worked up in Mandalay is brought from the Myitkyina District. The following extract from Mr. Warry's Report of 1888 is taken from the Myitkyina Gazetteer :—

"In the Chinese Temple at Amarapura is a long list containing the names of upwards of 6,000 Chinese traders deceased in Burma since the beginning of the present century to whom funeral rites are yearly paid. The large majority of these men are known to have lost their lives in the search for jade. The roll includes only the names of well-known and substantial traders. Could the number of smaller traders and adventurers who perished in the same enterprise be ascertained, the list would be swelled to many times its present size.

"In 1861 the first Cantonese merchant arrived in Mandalay. He bought up all the old stocks of jade and conveyed them to China by sea realising a large fortune on this single venture. His example was quickly followed by other Cantonese. From that date until now the bulk of the stone has been carried by sea to Canton."

Jade is taken to Mandalay where it is sold for export to China. Some is however cut in Mandalay and made up into necklaces, rings, earrings and other ornaments. The stone is cut into shape by a metal disc spread with a wet abrasive powder. It is then fixed into a sort of putty at the end of a small stick and polished on an emery board.

Amber. Amber workers have not changed their methods and the following extract from the Upper Burma Gazetteer contains a description of the industry which still holds good :—

"Even in Mandalay the succinite or Prussian amber is easier to procure and cheaper than the Burmese amber. Nevertheless it has been largely used for centuries by the Burmese, and the cutting and polishing was formerly quite an industry in Mandalay and previous capitals. The chief articles produced were beads for rosaries, *nadaungs* (ear cylinders) and various trinkets in the shape of elephants, monkeys, fish and the like. Figures of Gaudama were also

occasionally carved. The manufacture of beads, which is the commonest article, is very simple. The amber is cut into small cubes with a sharp knife: the corners are cut off and a hole is drilled with a flat edged needle fitted into a bamboo. The bead is then shaped with a file curved at the upper end and finally polished, first with a dried leaf which contains a considerable quantity of silica and then with petrified wood."

Trade Routes.

The principal trade routes of the District are (1) the Railway, (2) the Irrawaddy River, (3) along the Chaungmagyi and Shwetachaung, (4) the Mandalay-Lashio Road and (5) the Myitngè River.

Of these the railway is by far the most important (See Chapter VII). Trade on the Irrawaddy is mainly in the import of paddy from Katha and Shwebo and the export of rice to the riverine districts of the dry zone. Exports by rail include paddy, fruit and vegetables, and timber and silk goods. Imports by rail include most of the necessaries and luxuries of life especially piece-goods, petroleum and European and Indian manufactured articles.

Trade with the Shan States.

There is considerable trade with the Shan States, the bulk of it being rail-borne. There is a Trade Registration Office on the eastern outskirts of Maymyo for the trade which follows the Lashio-Mandalay Road.

The total value of imports by the railway *viâ* Maymyo and by the Maymyo (road) route during 1922-23 was Rs. 4,45,67,596 and Rs. 4,11,176 respectively; and the value of exports by the same routes for the same period Rs. 4,49,95,723, and Rs. 5,08,583.

Bazaars.

As regards the distribution of goods within the District there are shops in Mandalay and Maymyo and a few in Amarapura and Madaya. The bazaars of Mandalay itself are the chief centres for the exchange of commodities for all the country side within reasonable distance of the city. The bazaars in Mandalay Town number fourteen, *viz* Zegyo, Yahaing, Payagyi, Mingala, Nyaungbin, Yodaya, Nandawshe, Miba, Pônna, Seinban, Thuyè, Nyunbaung, Singyôn, Myetpayat. In the Amarapura Township there are bazaars at Amarapura, Myitngè, Leiksangun, Ywekyubauk, Tagundaing, Amyaukbôno, Sado and Pôndawnaingngan. In Madaya Township there are bazaars at Madaya—where the District Council has recently abolished the slaughter-house—and Nyaunggôn, and a five-day bazaar at Ônhmin, and in the Singu Township at Singu and Shwepyi. In the Maymyo Subdivision there is a bazaar in Maymyo with a special bazaar every five days and a bazaar once every five days at Wetwun and Pyintha.

CHAPTER VII.

MEANS OF COMMUNICATION.

Railways—Passenger Traffic—Goods Traffic.

Waterways—Roads—Divisions—Principal. Roads of the District (i) Main Roads; (ii) District Roads; (iii) Other Roads.

Maymyo Subdivision—(i) Municipal Roads; (ii) District Fund Roads; (iii) Provincial Roads—Metalling—Public Conveyances—Ferries—Posts and Telegraphs—Bungalows.

Railways. There are four lines of railway in the district and a connection for goods traffic only, between Mandalay Station and Mandalay Shore. The main line from Rangoon to Mandalay connects the Myitngè River with Mandalay Town. This line runs just within the western limit of the irrigated area, with stations at Myitngè, Tagundaing, Myohaung and Shanzu. The Mandalay Lashio branch leaves the main line at Myohaung, runs through the irrigated area to the foot of the hills, through the Maymyo Subdivision and crosses the border of the District into the Shan States at Wetwun. Between Myohaung and Wetwun there are seven stations—Tônbo at the eastern limit of irrigation; Sèdaw at the foot of the hills; Zibingyi, Thôndaung and Anisakan on the hill-section; Maymyo and Pwegauk. The Mu Valley Line, which connects Mandalay with Sagaing, branches from the main line at Myohaung and runs through Amarapura to Amarapura Shore whence a coach-ferry crosses to Sagaing. The Mandalay-Madaya Light Railway (two feet six inches gauge) starts from a station near the Zegyyo and runs along the bund of the Shwetachaung Canal with halts at Nyaungbinze, Mibaze, Obo, Kabaing, Taungbyôn, Lundaung, Kabè and Wayindôk. The line was first started as a private enterprise in 1906 but it was not until 1912 that it was opened to traffic as far as Taungbyôn. After some financial vicissitudes the line was completed to Madaya and opened to traffic in May 1917 and after more financial difficulties was taken over by Government in 1923. The occupation of the Shwetachaung bund by both a railway and a road has been found to cause great inconvenience and a re-alignment of the railway is now being carried out. The new line will be of metre gauge and will start from Mandalay Station and run through the Fort past the Brewery to Obo, then to the east of Kabaing and Taungbyôn past

Lundaung, Kabè and Wayincôk to Madaya with stations at the places named and also immediately north of the North Moat Road.

ssenger ffic.

The greater part of the passenger traffic is local in character. The yearly numbers of passengers travelling from the principal stations are :—

Mandalay	...	560,000	About half local traffic which is very heavy between Mandalay and Kyauksè.
Shanzu	...	400,000	
Myohaung	...	200,000	Nearly all local traffic.
Myitngè	...	200,000	
Amarapura	...	182,000	All local traffic, about half being passengers to Shanzu.
Amarapura Shore	...	111,000	
Maymyo	...	111,000	About half local traffic.
Wetwun	...	22,000	Mainly to Maymyo.
Zibingyi	...	10,000	Mainly local.

oods raffic.

There is little goods traffic inwards at any station except Mandalay where 100,000 tons are handled yearly. This consists mainly of grains from Kyauksè, Shwebo and Katha District. Yearly goods traffic outwards from Mandalay amounts to 60,000 tons of various goods mainly to Rangoon; from Mandalay Shore 45,000 tons, principally timber and mainly to stations south; from Zibingyi 15,000 tons of lime; from Tônbo 11,000 tons of stone; from Myohaung 5,000 tons and from Maymyo 3,500 tons of various goods.

aterways.

The Irrawaddy River is the chief waterway of the district. A list of steamer routes may be found in Volume B. Mail and Cargo steamers ply between Mandalay and Rangoon and Mandalay and Bhamo; and there are ferry services, between Mandalay and Thabeikkyin calling at Tôngyi, Sithè and Singu; Mandalay and Myingyan; and Mandalay and Ava. The last named is found useful by villagers from the south-west corner of the district.

In the rains and early cold weather the Chaungmagyi is much used for floating logs and bamboos down from the forests and for the conveyance of plantains.

There is considerable passenger traffic along the Shwetachaung Canal which is also the usual route for bringing fruit down to Mandalay from the Madaya gardens. In the rains boats can pass freely between this canal and the Chaungmagyi. Formerly the Thapangaing *chaung* which flowed into the Shwetachaung was used for traffic but it has now been bunded near Ônhmin where it crosses the

Mandalay Canal, and has been led into the Chaungmagyi, while a new cut from the Mandalay Canal keeps the Shwetachaung supplied with water in the hot weather.

On the Myitngè there is considerable traffic by boat and much rafting of timber and bamboos cut in the Shan States, the Yeyaman Hill tract and the hills behind Kywetnapa. It is navigable in its lower reaches for country boats throughout the year and there is considerable ferrying activity between the villages on both banks.

Before the Annexation there were no proper roads and except in the neighbourhood of the royal palace where the roads were spasmodically put in to some sort of repair when the King was going to use them, there were only cart tracks which meandered through the *kwins* and were subject to much inundation. These tracks were sometimes carried across swamps on brick causeways such as the old *Ŏktada* and Nanmadaw *tada* across the Taungthaman Lake. The most important road was the Lanmadaw from Amarapura to Ava, of which traces can still be seen at intervals in the *kwins* between Amarapura and the Myitngè River. Besides the Nanmadaw *tada* and *Ŏk-tada* there are also a number of high wooden bridges still in existence but most of them have fallen sadly into disrepair. All these bridges were built by wealthy traders or officials or with public money. Only two are now of any importance—the Athi-hôno *tada* and the U Bein *tada*. The former is about 600 feet long and spans the Sagyinwa inlet of the Taungthaman Lake and in the rains is the only means of communication for foot-passengers with the villages to the immediate south of Amarapura. The U Bein *tad* —built by a *myo-saye* of that name—is about 1,000 yards in length and is carried across the Taungthaman Lake from Amarapura to Taungthaman Village. Maung Bein, himself a Mohamedan, was an agent and follower of Maung Bai Sat or Bhai Shahib, the infamous favourit of Pagan Min. The bridge is very useful, especially in the rains when the country round is i undated and impassable. **Roads.**

Apart from roads inside Cantonments, which are maintained by Cantonment authorities, and roads inside Municipal limits, which are maintained by the Municipality, roads are divided into Main Roads maintained by the Public Works Department out of Provincial Funds and District Roads maintained by the District Council out of the District Fund. In the Maymyo Subdivision which is outside the sphere of the District Council, District roads maintained out of the **Division**

Deputy Commissioner's Local Fund are in charge of the Public Works Department.

Principal Roads of the District (i) Main Roads.

The best road in the District is the road from Mandalay to Lashio through Maymyo which is metalled as far as the border of the Shan States at Wetwun, 55½ miles from Mandalay. The road leaves the Mandalay-Yankintaung Road about 1 mile from the East Gate of Fort Dufferin and passes through the middle of the irrigated area south-east of Mandalay, crossing the Mandalay Canal at Kyaukmi, before, entering the hills.

2. Mandalay to Yankintaung Road, 4½ miles long and metalled throughout, runs from the East Gate of the Fort due east through the irrigated area to the stone quarry at Yankintaung.

3. Yankintaung-Patheingyi-Chaungwun Road, 2¼ miles long and metalled throughout, connects Mandalay with the northern portion of the Mandalay Canal. It leaves the Yankintaung Road near the fourth mile, whence it runs north to Patheingyi (1¼ miles) and then turns east to Chaungwun on the Mandalay Canal.

4. Mandalay-Amarapura Road is metalled throughout. It runs along 84th Street from the Clock Tower to the Arakan Pagoda when it turns west and then south again to the Municipal Boundary at the 6th mile post. Up to this point the road is in charge of the Municipality. The portion from the Arakan Pagoda to the Municipal boundary is in a shocking condition and is in urgent need of repair. Traffic is very heavy and the holes which are being eaten into the edges of the road make it dangerous at night. From the 6th mile post a further stretch of 3 miles is in charge of the Public Works Department. The road is to be continued to Amarapura Shore.

5 An extension of "A" Road to join the Mandalay-Lashio Road at mile 3-[illegible] is metalled and in charge of the Municipality up to the Municipal boundary near the Leper Asylum. From the Leper Asylum to the Mandalay-Lashio Road, a distance of 1 mile, it is in charge of the Public Works Department.

6. The southern portion of the town is connected with the Mandalay-Lashio Road by an unmetalled road from Aungbinlè at the 6th mil on the Lashio Road to the Mandalay-Amarapura Road near Shanzu, The portion within Municipal limits is in charge of the Municipality.

7. The Myohaung Link Road—a short metalled road ¾ mile long—connects Myohaung Railway Station with the Mandalay-Amarapura Road.

8. A metalled road, 1 mile 3 furlongs in length, runs from the North Gate of the Fort past the Race Course and forms the first link in the Mandalay-Lamaing Road. It was formerly a Cantonment road, and its continuation round the east side of Mandalay Hill is still in charge of the Cantonment Authorities.

9. Madaya-Singu Road, unmetalled, in two portions, Madaya to Yenatha (8 miles) and Yenatha to Singu (24 miles) connects Township Headquarters at Singu with Subdivisional Headquarters at Madaya. The portion from Yenatha to Singu is really only a sandy track crossed by streams and subject to inundation in the rains.

(ii) District Roads.

(1) Mandalay-Madaya Road, 13 miles long, unmetalled, runs from Obo along the bund of the Shwetachaung Canal to Madaya. The bund is at present occupied also by the Mandalay-Madaya Light Railway and the road is too narrow for the heavy traffic which it carries. When the railway is removed it will be possible to repair and widen the road and probably either this road or the Mandalay-Lamaing-Madaya Roads will be declared to be a main road.

(2) Mandalay-Lamaing Road, 14½ miles long and metalled, leaves the North Gate-Race Course Road north of Mandalay Hill, runs North-East through the irrigated area to Lamaing crossing the Mandalay Canal at Letwègyi.

(3) Lamaing-Madaya Road, 5½ miles long and unmetalled, connects the Mandalay-Lamaing Road with the Shwetachaung at Madaya.

(4) A metalled road, 1¼ miles long, runs from the 5th mile on the Mandalay-Lamaing Road to the Shwetachaung only at Kabaing.

(5) A mud road, 1½ miles long, runs westward from the Mandalay-Madaya Road to Shwegyaung. The road is a track.

(6) Amarapura-Tamôkso Road, 10¼ miles long, embanked for most of its length but unsurfaced, runs from Amarapura across the railway at Tagundaing past Sauktawwa to Tamôkso, whence an old tank bund runs to Tadaingshe on the Mandalay Canal. The road serves numerous large villages and has grown in importance since the extension of irrigation to this neighbourhood and requires considerable improvement.

(7) A road from Myitngè to the Amarapura-Tamôkso Road at Sauktawwa, 5 miles long, carries considerable agricultural produce to the railway at Myitngè. It was formerly merely a cart track but is now being embanked.

Other Roads. Six roads which formerly were nominally maintained from the District Fund were classed by the Road Proposals Committee, 1917, as Village Roads. They have never been regularly kept up and are merely cart tracks. These roads are (1) Kyaukmi-Môndaw, (2) Lundaung-Linmwechaung, (3) Madaya-Ônhmin, (4) Lamaing-Ônhmin, (5) Ônhmin-Sagabin, (6) Singu-Chaunggyi.

Paths along the canals and distributaries, which intersect in all directions the country between the Myitngè and the Chaungmagyi, are not open to cart traffic but are very useful for ponies, cyclists and foot-travellers.

Maymyo Subdivision. Cantonment authorities have charge of all roads within Cantonments. The Municipality has charge of the roads in the Bazaar area of Maymyo Town except the Mandalay-Lashio Road, Bund Road and Zigôn Road which together with the other roads within the Municipal area are maintained by the Public Works Department out of Provincial Funds—as is also a short road from Circular Road near Cantonments towards Naungkangyi and the Waterworks. All these roads are metalled. Three roads are maintained out of the Maymyo District Fund by the Public Works Department:—

(1) A metalled road, three miles long from Nyaungbaw at mile 22·37 on the Mandalay-Lashio Road to the railway at Zibingyi.

(2) A metalled link road from the Mandalay-Lashio Road at mile 36·62 to Ani-akan railway station.

(3) An unmetalled extension, 1 mile long, of the Cantonment road near the Mountain Battery towards Sinlan Village.

Metalling. Mandalay District is rich in limestone of which the best qualities furnish a fairly good road metal. The principal quarries are situated at Yankintaung, at Tônbo, at the 17th and 21st miles on the Mandalay-Lashio Road, near Thôndaung and at Kyauktaung just outside Maymyo. Stone is also quarried near the Lamaing Road and soft stone suitable for soling is found at Mandalay Hill. Basalt from the Lethataung near the Mogôk border has been used on several of the Mandalay Municipality's roads.

Public Conveyances. An electric tramway was opened in Mandalay in August 1904 being the first electric tramway system in Burma.

The tramways have a route length of nearly seven miles, double-track throughout. The chief line runs from the Court Houses along Court-house Road, 78th Street (where the Power Station is situated) and B Road to the Zegyo, thence along 84th Street past the Arakan Pagoda to Shanzu. From the Zegyo another line continues along B Road to the Shore. In 1909 a license was granted to this company to sell electricity for lighting purposes, and it now supplies all the chief roads within the Municipality and also several Pagodas. Electric lighting has recently been extended to some roads within Cantonments. A taxi service runs from Amarapura Railway Station to the Zegyo at the moderate charge of Rs. 2 and taxis may also be engaged for the journey to Maymyo and back. Motor omnibuses run from the Zegyo to Lamaing and to Patheingyi. Ticca gharries ply for hire in Mandalay and Maymyo Towns and between Mandalay and Amarapura, Patheingyi and villages along the chief roads in the vicinity of Mandalay. Bicycles are increasing in popularity, but in the rural areas the cart remains almost the sole means of locomotion.

Ferries. There are five ferries in the District, *viz.* across the Irrawaddy at Powa-Shinhla and Magauk; across the Chaungmagyi at Sagabin and Tangathi; and across the Myitngè at Migyaungdet.

Posts and Telegraphs. There are Post Offices at Mandalay and Maymyo, Amarapura, Myitngè, Madaya, Singu, Myohaung and Anisakan. Villages in the district are visited periodically by village postmen. The larger villages are visited about twice a week but the smaller and less accessible villages only receive their letters at uncertain intervals.

There are telegraph offices at Mandalay, Maymyo, Amarapura and Madaya in addition to the railway telegraphs and telephone communication between Mandalay and Maymyo. The Irrigation Department Bungalows also are provided with telephone communication with each other and with Mandalay.

Bungalows. The district is fairly well equipped with bungalows. Those along the canals are in charge of the Irrigation Branch and the others of the Roads and Buildings Branch of the Public Works Department. There are also a number of Forest Bungalows in various stages of disrepair in the Maymyo and Singu Townships. A list of Bungalows is given in Volume B.

CHAPTER VIII.

FAMINE.

Nil.

CHAPTER IX.

GENERAL ADMINISTRATION.

Historical, Pre annexation; Post-annexation; Pacification of plains; Pacification of the Maymyo Subdivision; Changes in Organisation; Present General Administration; List of Deputy Commissioners; Village Administration; Civil Justice Administration; Crime; Police; Police Training School; Military Police; Jail; Military; Marine Transport Office and Marine Workshops; Ecclesiastical, Roman Catholic, Church of England, S.P.G., Wesleyan Mission, American Baptist Mission; Income-Tax; Trade Registration; Local Fund Audit; Public Works, Roads and Buildings; Agricultural; Excise; Veterinary; Saunders Weaving Institute; Registration.

torical; -annexa-.

The boundaries of the Mandalay District or *Mandale-Myo Shwe-gyo that nè*, as it was called under Burmese rule, differed somewhat from those of the present date. Its boundaries were :—

North.—The Madaya river or Chaungmagyi from its confluence with the Irrawaddy, as far east as the Yegyi-Kyabin Circle;

East.—The boundary of the Yegyi-Kyabin Circle, and southwards along the foot of the hills;

South.—The Myitngè river, from the boundary of the Ônkun *nè* (which now forms part of the Maymyo Subdivision) to the Irrawaddy;

West.—The Irrawaddy river.

It included the following *nès*:—

Lamaing-nè, under the control of an official called the Aungbinlè-Lamaing *wun*. It was sometimes subdivided into *nès*, the *Letwèdaw nè* and *Letyadaw nè*, under *nè ôks*.

Tamôkso nè, under a *nè-ôk*.

Amarapura myo nè under a *myoôk*.

Kyun-kye-ywa nè, consisting of the islands in the Irrawaddy under an officer called the *Dipa Bo*.

Taungbyôn nè and Kutywa nè, were at one time ruled by *nè-ôks* but were later united into one charge under a *wun*.

Madaya Myo-nè, was under a *myo-wun*.

All these officers had under them *myothugyis* and *thugyis*, while in addition the Aungbinlè-Lamaing *wun* had two *sayes* and the Madaya *myo-wun* had two *rè-sayes* to assist him in the administration of the canals in his charge. The *wuns* of Lamaing and of Taungbyôn-Kutywa drew fixed yearly salaries of Rs. 2,400 per annum and the remaining *myowun*, *myoôk* and *nè-oks* drew Rs. 1,200 per annum. The *sayes* were paid Rs. 600 per annum. *Myothugyis* and *thugyis* were paid a ten per cent. commission on their collections; but instead of deducting it themselves as elsewhere, it appears to have been paid over to them by the *Akundaw Tana* when they paid in their collections. Their appointments were hereditary. All officers were at one and the same time Magistrates, Judges, Revenue Officers, Police Officers and Engineers and there were no rules to limit their powers or define their duties. Serious cases were however generally tried by *wuns*, *myoôks* or *nè-oks*. All criminal appeals lay to the *Shwe-yon-daw* in Mandalay presided over by *myo-wun* and thence to the *Hlutdaw* as the Supreme Court. Civil appeals lay to the Mandalay Civil Court and thence to the *Hlutdaw*. If the appeal was pronounced frivolous, the appellant was subject occasionally to be punished with stripes. In Revenue cases appeals lay to the *Akundaw Tana*, except where Royal lands were concerned which were dealt with by the *Lè-yôndaw*; from both Courts further appeals lay to the *Hlutdaw*. All these Courts were at liberty to entertain cases as Courts of original jurisdiction.

Mandalay town was under the jurisdiction of a *myowun* whose Court was termed the *Shwe-yon-daw*. He had four *taung-hmus* under him who exerted civil and criminal jurisdiction over the four quarters of the town. Under them were *myo-sayes* and *taung sa-chis* who had similar jurisdiction within their *nès*. There was no limit to the number of these officers. *Ayat ôks* tried both classes of petty cases within their quarters. There were also officials called *shwe-gyi-zos* who recorded all sales and transfers of land and collected fees at a rate of 2½ per cent.

ad valorem. They were under the orders of the *myowun*: and had *sayes* to assist them. In charge of the gates were *tagabos* who appear also to have carried out certain police duties. Their assistants were called *taga-hmus*. The *myowun* was paid Rs. 8,000 per annum, *taung hmus* and *myo-sayes* Rs. 1,200, *taung-sa-chis* and *shwe-pyi zos* Rs. 600, *taga-bos* Rs. 240 and *taga-hmus* Rs. 180 per annum. *Ayat-ôks* got *nyin-gnin* or costs levied from both parties in the suits they tried and *shwe pyi sayes* took 10 per cent. on the value of the land sold or transferred under their supervision. With the exception of the last two classes, who were appointed by the *myowun* all these officers were appointed by the King. In each of the courts of *wuns*, *myoôks* and *nè-ôks*, was an official appointed by royal order called the *kun-bo-tein* who collected the fee called *kunbo* at the rate of 10 per cent. on the value of the suit; he also kept an account of collections submitted from lower courts and at the end of the year sent his accounts with money to the *Hlutdaw*, through his superior officers. He occasionally paid over the money to the Chief Queen. He received Rs. 50 per mensem.

What is now the MaymyoSubdivision was administered nominally by a *wun* and above him by a *mingyi*, both of whom resided permanently in Mandalay. The *wun* was called the *saingya-min wun*. The resident officials were *nè ôks* of whom there were four just before the annexation at Letya-chaukywa North (Wetwun) and South (Maymyo) Twin-ngè and Thôndaung. As there was a royal garden at each of their headquarters they were styled *U-yin nè-ôks*. The head of the Onkun *nè* was a *thugyi*. Important criminal cases were sent to the *wun* for disposal but the prisoner and witnesses were rarely sent to Mandalay, their depositions being considered sufficient for the disposal of the case. Civil cases were appealable to the *wun*. Dacoity, theft, rebellion, arson and hurt, drawing blood, were the only criminal cases. Petty cases were decided by the *nè-ôks* themselves and the only record of the case was the judgment. The *nè-ôk* received Rs. 50 per mensem and 10 per cent. of the fine imposed in criminal cases, the balance going to the complainant. In civil cases the *nè-ok* got 10 per cent. above the amount awarded from the loser of the suit. None of the money realized in either civil or criminal cases was credited to Government. The *kunbo* appears rarely to have been paid as the *kun-bo-tein* is only once known to have visited the

subdivision; but the number of civil cases instituted probably rarely exceeded two or three a year. There were no jails and all prisoners had to be sent to Mandalay. Under the *nè-ôks* were *daing-gaungs* and *a-hwuns* who were later called *ywa-ôks* and *ywa-gaungs*.

Post annexation.

Immediately after the occupation of Mandalay by the British, the town, with as much of the surrounding district as could be controlled from the capital, was placed in charge of the late Mr. T. F. Fforde, District Superintendent of Police, assisted in the administration of the town by two *myowuns* (U Pe Si and the Nyaungyan *wundauk*) who had long been connected with the local government of Mandalay. For a short time the State Council under Colonel Sladen's presidency exercised control over the Mandalay officials. But towards the end of 1885 the capital and adjacent country were removed from the charge of the *Hlutdaw* and placed directly under Colonel Sladen. In the middle of December, Captain C. H. E. Adamson assumed charge of the whole district.

Pacification of the plains.

The Town was steadily reduced to a state of order, but in the early months of 1886, beyond the limits of the town and suburbs, Mandalay District was almost entirely in the hands of three or four leaders, who had large followings and acted to some extent in concert. The villages were made to pay blackmail and disobedience of orders, or attempts to help the Government, were severely punished. These leaders professed to be acting under the authority of the Myingun Prince (then a refugee in the French settlement of Pondicherry) and were kept together by a relative of that Prince, a person who styled himself the *Bayingan* or Viceroy, and went from one to the other giving them information and arranging combinations between them. The Madaya subdivision was kept in a perpetual state of disturbance by Bo Zeya until the middle of 1887, when his gang was finally broken up. Bo Zeya fought at first nominally for the Myinzaing *Mintha*, but after the death of the *Mintha* he carried on raids on his own account with a band of mixed Shans and Burmans, estimated at times to be more than 1,000 strong. In October 1886 he made a determined attack on Madaya but was beaten off by the *Myowun* Maung Ka. In December of the same year, however, the *Myowun* was less successful, though he held out for a whole day. The town was burnt to the ground as well as the neighbouring villages of Uyindaw and Thayettan. Bo Zeya afterwards

gave a good deal of trouble ; he held the tract of country known as Yegyi-Kyabin on the east of the Madaya township and showed fight at Zibyubin ; but when his camp was broken up he left the district and after taking refuge for some time on the borders of Tawng Peng and Môngmit, moved into Chinese territory, where he remained. In June 1886, the Lamaing post commanded by Captain J. E. Preston was attacked by a party of Shans, a few of whom got inside the post, killed a jemadar and a sepoy, and wounded Captain Preston. They were driven out by the camp followers. Nga To and Nga Yaing held the islands on the Irrawaddy and were harboured and supported by the villages near the river bank on the borders of Mandalay, Shwebo and Sagaing. Nga To was especially active and in 1888 burnt a village almost under the walls of Mandalay ; he was hotly pursued in the early months of 1889 and every member of his gang was either killed, captured, or compelled to surrender. Nga To himself escaped, and is supposed to have died of privation on the Sagaing side of the river. Nga Yaing's gang was dispersed and he himself was captured and executed at Shwebo. In 1886 the Amarapura subdivision was disturbed by the supporters of the Myinzaing *Mintha* and Tanôkso and its neighbourhood were held by them for some months. When the *Mintha* died, however, the subdivision became quiet. There was a slight revival of disturbance in 1889 with the appearance of Bo Kyaw Zaw and his lieutenant Bo Thin, but they were soon driven into the Shan States and thence into China. Minor leaders were Ôktama, Nga Lan, Nga Gaw Ya, Nga Thein, Nga Pan Gaing, Nga Yein, Nga Tha Aung, Nga Tha Maung, Nga Aung Min and Nga Lu. By steady perseverance, and without demanding more than occasional assistance from the troops, the district was freed from all these leaders. Three were killed, seven were captured, and twenty-five surrendered. In some instances they accepted service under Government and did good work in assisting to maintain order. What crimes there were, were the acts of local criminals and not of standing bands. The district of Mandalay had not been so peaceful and secure since the time of Mindôn, and dacoity and cattle lifting had never been so rare.

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division.

Naw Môug, the son of Naw Hpa who was formerly *Sawbwa* of all Hsenwi, had been detained throughout Thibaw's reign as a prisoner in Mandalay. The British

occupation set him free, and on his way up he passed through the camps of the Myinzaing *Mintha* and of Saw Yan Naing. The Myinzaing *Mintha* was the only member of the Burmese Royal Family whose position was of real importance. He was a son of Mindôn and the Letpanzin queen, who had escaped massacre by Thibaw partly because of his youth and partly because, being a son of the minor queen, he was inconspicuous and easily hidden by his friends. At the time of the Annexation he was seventeen years old. He was, no doubt, led into opposition to the British Government by certain influential officials of the late Burmese Government of whom perhaps the most prominent was the *Anauk Windawhmu* U Paung. When Mandalay fell, the Myinzaing *Mintha* fled to the east and with some two hundred followers encamped at Zibingyi. Before the fall of Mandalay, the local officials in what is now the Maymyo subdivision had received orders to collect men and to proceed to the capital. On the way down they learnt that the British were already in Mandalay, whereupon they returned with their followers. The Myinzaing *Mintha* summoned them to his camp and in course of time they all appeared there, with the exception of the Letyachaukywa N. *nè ôk*, who fled to Mandalay. In January 1886 four Europeans, including Mr. Grey of the Bombay Burma Trading Corporation, determined to return to their work in the forests. They were attacked near Singaing in Kyauksè District and after four hours resistance were all killed except Mr. Grey who was taken prisoner and carried off to the camp of the Myinzaing *Mintha*. The Thondaung *nè-ôk* while visiting the camp saw him there, tied up with ropes. On the approach of British troops he was brutally murdered. The Myinzaing *Mintha* was driven out of his position and on January 10th Mr. Grey's mutilated body was found near the deserted camp. On the march to Zibingyi Captain Lloyd, R. E. and two men of the Hampshires were severely wounded at Tônbo. The *Mintha* retreated into Kyauksè and later died of fever at Ywanan. The column returned to Mandalay; on their way back they were again attacked at Tônbo and several sepoys were wounded.

The Letyachaukywa Se *nè-ôk* had just arrived at the *Mintha's* camp when news reached him that Pyinulwin (Maymyo) had been attacked and burnt by the Hsum Hsai *myosa's* men under the *Heng* of Bawgyo, and with the *Mintha's* permission he collected men from all the *nè* and

went back to Pyinulwin where he found the Bawgyo *heng* and his men encamped near the pagoda. He attacked and fought them for a day and a night, and finally drove them out. There were about forty men killed in the fight round the pagoda. The Pyinulwin men followed up the Shans and burnt to the ground the villages of Wetwun and Pinlein which had assisted their opponents; they also fired three villages in Hsum Hsai State, the Hsai *myosa* having fled to the Gokteik Pass. These events took place in March and April 1886, and the fighting went on till November when British troops arrived at Pyinulwin. In February 1886 two Military Police levies, each of 561 officers and men, were sanctioned. One was told off for service in the Mandalay District with the intention that it should eventually take up the posts required for the protection of the Shan States. Mr. A. D. Kiernander, subsequently Deputy Inspector-General of Police, established a post at Kywetnapa in June, and in October was besieged there by various *bos* from the hills and from the plains of the Mandalay and Kyauksè districts. After three days Sir George White came out to the relief of the post. Mr. Kiernander writes. "I cannot speak more highly of work done even by regular troops, and in spite of continuous illness they carried out their dacoit hunting, going out at nights without a single man shirking this dangerous and unpleasant work. At the time we were besieged I don't think I had more than half a dozen men out of a full company really fit and if they had been kept at this post much longer the whole levy would have been invalided out of Burma." It was then decided that the troops must make a move up the hill. The column, which went up by the Ônhnè Pass, was commanded by Colonel Stedman of the 3rd Gurkha Rifles, whose regiment was only required to go up the hill. A company of the 23rd Madras Regiment was to have accompanied the column, but the Madrasis could not stand the cold and returned from Zibin to their base at Tônbo. The column was attacked between Ônhnè and Pebin losing two sepoys, a British officer was wounded also and taken back to Mandalay. A post was then formed at Pebin (Zibingale) and a British officer left in charge of it. The troops pushed on with Mr. Kiernander as Civil Officer attached to the column; after they reached Pyinulwin, Mr. (now Sir H.) Thirkell White came up. Maung Lwin, the Letyachaukywa N. *nè ók*, who had fled to Mandalay, came up with the

column, and the *myothugyi* of Twinngè joined it on the way. These two men were appointed *nè-ôk* and messages were sent to Bo An of Thôndaung and Maung Tôk Gyi of Pyintha (Ônkun) who came in and were also appointed *nè-ôks*.

Saw Yan Naing was the son of the Mekkaya Prince. Immediately after the Annexation he and his brother (known as the Chaunggwa Princes) gave trouble in the Ava District, but he was driven eastwards and through the Pyinulwin subdivision, and retired to Man Sè in the Northern Shan States Hkun Sang of Tôn Hong defeated him and drove him into Loilong Tawng Peng and then, proceeding on his march, defeated Naw Mong.

Another cause of trouble was the Setkya *Mintha*. This man appeared first in the Yeyaman Hill Tract dressed as a *koyin* in a yellow robe. He was reported to have a permanent following of 200 men and to be able to call out 300 more when required. A party went out from Pyinulwin to Lèma where the *Mintha* was encamped on Taungma Hill; the position was attacked and taken but Lieutenant Darrah, Assistant Commissioner at Maymyo, was killed, and a British officer wounded. The *Mintha* was driven first into the Kyauksè District and then int the Shan States, where he was captured and sent back to Kyauksè, where he was hanged.

In 1887 the Setkya *Mintha* had been joined by another insurgent, Bo Kyaw Zaw. After the Annexation this man lay low in the jungle along the Myitngè River. When the *Mintha* had been driven out of Maymyo he haunted for a time the wild and difficult country on the south-east border of the Mandalay District, but in 1890 special operations were opened against him. His gang was broken up and he was forced to move northwards through the Northern Shan States and eventually joined the small party which had collected round Saw Yan Naing.

The Subdivision soon settled down after it had been reorganised and in the open season thousands of pack bullocks began to come down from the Shan States and from China. The Mandalay Municipal returns show that in 1887-88, 13,300 pack bullocks with goods valued at Rs. 4,56,518 came in by the Hsipaw route; in 1888-89 the number of pack bullocks was 27,170 with goods valued at Rs. 7,30,279.

On the 4th of December 1886 two Subdivisions, Madaya and Pyinulwin, were formed and on the 29th of January 1087 the formation of a third, Mandalay was

Changes Organisation.

notified. The constituent Townships at first appear to have been :—

Madaya.	*Pyinulwin.*	*Mandalay.*
Madaya	Letyachaukywa North	Alaunggyun
Nga Singu	Letyachaukywa South	Amarapura
Kutywa Taungbyôn	Thôndaung	Tamôkso
Lamaing Letwedaw (North)	Ônkun	Lamaing Letyadaw (South)
	Twinngè	

During 1887 the name of the Mandalay Subdivision was changed to that of Amarapura and Alaunggyun Township disappeared, apparently by amalgamation with the Kutywa-Taungbyôn Township ; as however postings of Subdivisional Officers to the headquarters Subdivision, Mandalay, can be traced early in 1888 it would appear that the name was retained for the post held by the officer in charge of Mandalay town, a post previously held by the *myowun*. In September 1887 a notification shows a Township Officer at Pyinulwin, but as this was the headquarters of the Subdivision as well as of the Letyachaukywa South Township it is probable that he was a Headquarters Magistrate.

In 1895 the Townships of Madaya and Kutywa Taungbyon in the Madaya Subdivision were amalgamated under the name of the first with headquarters at Lundaung. At the same time an area belonging to the Singu township lying south of the Chaungmagyi to the west of the Shwetachaung was transferred to the Madaya Township. In 1896 the headquarters of the Madaya Subdivision and Township were transferred to Madaya from Singu and Lundaung respectively. In 1889 the Lamaing North Township was transferred to the Amarapura Subdivision.

In 1890 the Twinngè Township in the Pyinulwin Subdivision was abolished and divided between the the Letyachaukywa South and Thôndaung Townships. In 1895 the Ônkun and Thôndaung Townships were amalgamated and named the Ônkun Township with headquarters at Pyintha. In 1897 the names of the Subdivision and Townships were altered as follows :—

Old name.		*New name.*
Pyinulwin ...	...	Maymyo*
Letyachaukywa South	...	Maymyo
Letyachaukywa North	...	Wetwin
Ônkun ...	...	Pyintha

* The military post at the Pyinulwin had been renamed Maymyo as far back as June 1887.

In 1906 the Pyintha, Wetwun and Maymyo Townships were combined into one Township with the name of, and headquarters at, Maymyo.

On the 16th of February 1889 the Amarapura Subdivision was extended by the addition of Lamaing North Township, which was transferred from the Madaya Subdivision and amalgamated with Lamaing South Township under the name of Lamaing Township with headquarters at Patheingyi. On the 16th of March 1889 the Tamôkso Township was absorbed by the Amarapura Township. In 1897 the Lamaing Township was renamed the Patheingyi Township. In the same year Alaung and other villages near the Irrawaddy were transferred from the Madaya to the Patheingyi Township.

From the 28th of August 1888 the boundaries of the Mandalay Subdivision were declared to be the same as those of the Town and the Cantonment, namely:—

On the West.—The River Irrawaddy.

On the North.—The northern boundary of the Cantonment to the point where it meets the north town rampart, thence the north town rampart to its north-west corner and thence a line drawn west to the Irrawaddy.

On the East.—The eastern boundary of the Cantonment till it meets the east town rampart.

On the South.—The south town rampart to the corner where it meets the west town rampart, thence a straight line drawn due west to the river.

In 1895 the Mandalay Subdivision was divided into two parts, called the Eastern and Western Subdivisions.

The exterior boundaries of the District have remained practically unaltered since the Annexation. In 1898 the island known as Thamingyan-Paukwè was transferred from Sagaing to Mandalay and in 1900 a portion of the Singu Forest Reserve was transferred from the Mandalay to the Ruby Mines District while a portion of the Upper Madaya Forest Reserve was transferred in the opposite direction. In 1925 the boundary between Mandalay and Hsipaw, near Wetwun, was revised.

CENTRAL AND RESERVED DEPARTMENTS.

Preser General ministra

The district now consists of the Mandalay Subdivisions Eastern and Western, the Amarapura Subdivision with Amarapura and Patheingyi Townships, the Madaya Sub-

division with Madaya and Singu Townships and the Maymyo Subdivision and Township.

The district is under the general supervision of the Commissioner, Mandalay Division, resident at Mandalay and is in charge of a Deputy Commissioner. At headquarters is an officer who performs the duties of Headquarters Assistant and Senior Magistrate and another who combines the duties of Headquarters Magistrate and Treasury Officer; there is also an *Akunwun*. The two Mandalay Subdivisional Magistrates sit at Mandalay. There are also the Additional Magistrates and twenty-one Honorary Magistrates in Mandalay. The Subdivisional Officer in charge of each Subdivision is also Subdivisional Magistrate and similarly each Township Officer is also Township Magistrate. In Maymyo there is an officer who performs the duties of Treasury Officer and Headquarters Magistrate as well as a Township Officer, and at Pyintha the *Myothugyi* holds a special appointment as *Myoôk* drawing Rs. 50 *per mensem* salary. He ranks as an additional Township Officer. Otherwise there are at present no Additional Township Officers in the District. Benches of Honorary Magistrates exist as follows:—6 at Maymyo, 6 at Amarapura, 6 at Madaya and 4 at Singu.

ist of eputy-om-issioners the Man-lay Dis-ct since the nnexation.

Serial No.	Name.	Date of appointment	
		From	To
1	Captain C. H. E. Adamson	16-12-1885	14-7-1886
2	G. M. S. Carter ...	25-8-1886	7-9-1886
3	J. E. Bridges, I.C.S ...	8-9-1886	22-2-1887
4	T. F. Fforde (D.S. Police in charge.)	23-2 1887	28-4-1887
5	J. E. Bridges, I.C.S. ...	29-4-1887	26-3-1888
6	Lieut.-Col. C. B. Cooke ...	27-3-1888	10-5-1890
7	H. Adamson, I.C.S. ...	11-5-1890	7-3-1891
8	K. G. Burne	8-3-1891	5-12-1894
9	H. E. McColl, I.C.S. ...	6-12-1894	22-12 1894
10	H. Adamson, I.C.S. ...	23-12-1894	8-6-1895
11	Captain H.A. Browning, I.A.	9-6-1895	5-8-1895
12	G. F. S. Christie, I.C.S ...	6-8-1895	11-8-1896
13	Captain N. C. Perkins, I.A.	12-8-1896	30-11-1896
14	Captain H.A. Browning, I.A.	1-12-1896	8-7-1899
15	W. F. Grahame, I.C.S. ...	9-7-1899	31-7-1899
16	Captain H.A. Browning, I.A.	1-8-1899	22-2-1900
17	W. F. Grahame, I.C.S. ...	23-2-1900	29-7-1900
18	D. H. R. Twomey, I.C.S.	30-7-1900	4-2-1901

Serial No.	Name.	Date of appointment	
		From	To
19	R. G. Mckerron, I.C.S. ..	5-2-1901	7-2-1901
20	Major W. A. W. Strickland, I.A.	8-2-1901	31-3-1904
21	W. H. L. Cabell, I.C.S. ...	1-4-1904	26-1-1905
22	Major W. A. W. Strickland, I.A.	27-1-1905	17-2-1905
23	G. Scott, I.C S. ...	18-2-1905	11.5-1905
24	Major E.C. Townshend, I A.	12-5-1905	5-6-1905
25	J. L. MacCallum, I.C.S. ..	6-6-1906	17-7-1906
26	Major E.C. Townshend, I.A.	18-7-1906	4-5-1907
27	Major D. J. C. Macnabb, I.A.	5-5-1907	18-4-1908
28	Major G.R.K. Williams, I.A.	19 4-1 08	12-5-1908
29	Major H. DesVoeux, I. A.	13-5-1908	1 1-1909
30	C. F. Grant, I C.S. ...	2-1-1909	30-1-1909
31	Major H. DesVoeux, I.A....	31-1-1909	5-7-1909
32	Major A. S R. Roberts, I.A.	6-7-1909	14-9-1909
33	Major H. DesVoeux, I.A. ..	15-9-1909	1-2-1910
34	D. G. Robortson, I.C.S. ...	2-2-1910	18-4-1910
35	Major H. DesVoeux, I.A.	19-4-1910	9-7-1910
36	C. C. T. Chapman ...	10-7-1910	8-9-1911
37	J. P. Hardiman, I.C.S. ...	9-9-1911	22-9-1911
38	C. C. T. Chapman ...	23-9-1911	9-1-1912
39	Major H. DesVoeux, I.A.	10-1-1912	26-9-1912
40	E. J. Farmer, I.C.S. ...	27-9-1912	22-12-1912
41	H. H. Craw, I.C.S. ...	2 -12-1912	16-1-1913
42	W. F. Grahame, I.C.S. ...	17-1-1913	5-11-1913
43	H. H Craw, I.C S. ..	6-11-1913	9-11-1913
44	Lieut.-Col. S. L. Aplin, I.A.	10-11-1913	2-12-1913
45	W. F. Grahame, I.C.S. ...	3-12 1913	27-4-1914
46	W. J. Smyth, I.C.S. ...	28-4-1914	11-4-1917
47	T Couper, I.C.S. ...	12-4-1917	17-5-1917
48	W. J. Smyth, I.C S. ...	18-5-1917	24-8-1917
49	F. H. Steavenson, I C.S. ...	25-8-1917	11-10-1917
50	W. J. Smyth, I C.S	12-10-1917	23-1-1918
51	F. H. Steavenson, I.C.S. ...	24-1-1918	10-4-1918
52	W. J. Smyth, I.C.S. ...	11-4-1918	17-8-1918
53	F H Steavenson, I.C.S. ...	18-8-1918	8-10-1918
54	W. J. Smyth, I.C.S. ...	9-10-1918	29-10-1918
55	F. H. Steavenson, I C.S. ...	30-10-1918	1-12-1918
56	W. J. Smyth, I.C.S. ...	2-12-1918	11 2-1919
57	R. C. S. Keith, I.C.S. ...	12-2-1919	23-3-1919
58	A E. H. Killick, I.C.S. ...	24-3-1919	23 4-1919
59	H. N. Tuck	24-4-1919	17-10-1919
60	C. F. Grant, I.C.S. ...	18-10-1919	13-8-1920
61	H. Parker, I.C.S. ...	14-8-1920	5-10-1920
62	C. F. Grant, I.C.S. ...	6-10-1920	2-2-1922
63	J. E. Houldey, I.C.S. ...	6-2-1922	5-4-1922

Serial No.	Name.	Date of appointment	
		From	To
64	J. L. MacCallum, I.C.S. ...	6-4-1922	15-6-1922
65	C. B. deKretser, I.C.S. ...	16-6-1922	9-7-1922
66	J. L. MacCallum, I.C.S.	10-7-1922	8-4-1923
67	J. J. Bennison, I.C.S. ..	9-4-1923	13-4-1923
68	H. Parker, I.C.S. ...	13-4-1923	6-7-1923
69	F. B. Leach, I.C.S. ..	7-7-1923	25-3-1924
70	H. H. Craw, I.C.S. ...	25-3-1924	24-3-1925
71	U Po Saing ...	25-3-1925	5-4-1925
72	J. L. MacCallum, I. C.S. ..	6-4-1925	23-5-1925
73	U Po Saing	24-5-1925	29-5-1925
74	R. R. Brown, I.C.S. ...	29-5-1925	...

Village ministra- s.

There are 346 village headmen in the District (1924 figures), of whom 13 are *Myothugyis* receiving the entire commission throughout their circles; subordinate to them are 18 headmen who receive no commission: the average commission received is Rs. 204 per headman. The number of headmen is decreasing and the average amount of commission received is increasing, consequent on the policy of amalgamation which is carried out whenever opportunity occurs. There are 54 headmen exercising special criminal powers and 58 exercising special civil powers. They are organised into Headmen's associations, and conferences are held at intervals. In the case of appointment of new *thugyis* the hereditary principle is generally adhered to. The amendments to the Village Act introduced in 1925 will greatly modify village administration but the consequent changes are not yet complete in the Mandalay District and therefore no comment can yet be made. It is of interest to note in the 1924 Administration Report that in this District the formation of *Wunthanu* societies in the most cases aided the Deputy Commissioner, in that the other side of the case was presented to him, and in very few cases were they violently political. Compulsory upkeep of fences and *kins* was abolished throughout the District in 1924; the former had been only nominal in most villages for some time past. The only effect to date seems to be a reduction in the number of fines imposed by headmen and in the number of applications for revision of headmen's orders.

l Justice ministra-

Prior to the constitution of the High Court of Judicature in Rangoon a Judicial Commissioner was stationed at Mandalay; at present one of the Judges of the High

Court sits permanently at Mandalay and Benches are constituted as necessary by temporary visits of another Judge from Rangoon There is a District and Sessions Judge at Mandalay whose jurisdiction is that of the Mandalay and Kyauksè Districts. He is assisted by an Additional District Sessions Judge and there are also at headquarters, the Subdivisional Judge, Mandalay, the Small Cause Court Judge and the Township Judge of the Amarapura, Patheingyi and Madaya Townships. The Subdivisional Officers, Maymyo, Amarapura and Madaya are *ex-officio* Subdivisional Judges and the Township Officers, Singu and Maymyo, are the Township Judges. The Township Officers, Patheingyi and Madaya, are Additional Township Judges.

Crime. The dacoities of the troubled times that followed the annexation have been touched on in the paragraphs describing the pacification of the District. The following table which traces the variations in crime during the last ten years shows that there have been very slight differences from year to year except in the two past years 1923 and 1924, when the more serious kinds of crime showed a considerable increase; in this Mandalay is not unique but only reflects the increase in crime which the whole Province has suffered.

Year. (1)	Number of violent crimes (2)	Number of dacoities. (3)	Number of cattle Theft cases. (4)	All kinds of true cognisable cases. (5)	Number of cases sent up for trial. (6)	Number of cases convicted. (7)
1915 ...	36	3	31	2,038	1,930	1,584
1916 ...	25	4	18	3,095	2,915	2,545
1917 ...	43	6	23	2,492	2,325	1,965
1918 ...	37	7	27	2,664	2,509	2,113
1919 ...	41	4	30	2 745	2,564	2,009
1920 ...	35	4	36	3,013	2,573	2,122
1921 ...	35	4	27	3,003	2,796	2,195
1922	38	2	21	3,032	2,8[illegible]8	2,053
1923 ..	46	9	27	2,672	2,542	1,961
1924 ...	65	11	41	2,638	2,588	2,027

Police. The Police of the Mandalay District are in the charge of a District Superintendent of Police, who has a Deputy

Superintendent as his Headquarters Assistant. There are two Subdivisional Police Officers in charge of the two Subdivisions of Mandalay Town and one in charge of the Maymyo Subdivision. The statistics given at page 15 of the "B" Volume have been rendered out of date by the reorganisation suggested by the Police Enquiry Committee. Police stations are situated as follows:—

Mandalay Town ...	No 6 Lines Depôt. Nos. 4, 5, 8, 10, 13, 15, 16 and 17 Police stations. Nos. 1, 3, 7, 9, 11, 12, 14, 18 and 19 Patrol Posts.
Amarapura Subdivision	Amarapura Police-station Myitngè Police-station. Patheingyi Police-station.
Madaya Subdivision ...	Madaya Police-station. Lundaung Police-station. Singu Police-station.
Maymyo Subdivision	Maymyo Police-station.

The strength of the Police Force in Mandalay is (1925) 874 men. There are 7 Inspectors of Police, one of whom is the Court Prosecuting Officer, Mandalay, two Detective Inspectors and one each for the following circles; Headquarters, Cantonments, Amarapura and Madaya. There are four European Sergeants, one at Headquarters, one each for the Eastern and Western Subdivisions of Mandalay Town and one at Maymyo. The remainder of the force is distributed as follows :—

Headquarters. (1)	Sub-Inspectors of Police. (2)	Writers. (3)	Head Constables. (4)	Constables. (5)
Court Prosecutors at Mandalay ...	3	...	...	...
At Subdivisional headquarters ...	3	...	...	...
Subdivisional Officer's readers ...	3	...	...	...
Headquarters Lockup	2	...	2	...
Detective staff	3	...	...	...
Reserve	9	...	...	105
Remainder	4	...	6	61
Mandalay No. 4 Police-station ...	2	1	2	34*
Mandalay No. 5 Police-station ...	3	1	2	21
Mandalay No. 8 Police-station ...	6	2	3	36

* Of the Constables at Police-stations 27 are mounted.

Headquarters. (1)	Sub-Inspectors of Police. (2)	Writers. (3)	Head Constables. (4)	Constables. (5)
Mandalay No. 10 Police station ...	4	2	3	27
Mandalay No. 13 Police-station ...	3	1	3	28
Mandalay No. 15 Police-station ..	3	1	2	26
Mandalay No. 16 Police-station ...	4	2	3	37
Mandalay No. 17 Police station ...	2	1	2	19
Mandalay No 9 Patrol Post	...	...	2	25
Mandalay Nos. 1, 3, 7, 11, 12, 14, 18 and 19 Patrol Posts each.	...	...	2	15
Amarapura Police station	3	1	3	23
Myitngè Police-station	2	1	2	16
Patheingyi Police-station	2	1	2	16
Madaya Police-station	3	1	2	20
Lundaung Police-station	1	1	1	6
Singu Police-station	2	1	2	18
Maymyo Police-station	7	2	8	65
At Government House	...	...	4	6

In 1924 Kyaukmi Police-station in the Patheingyi Township, Yenatha and Shwepyi Police-stations in the Singu Township, and Wetwun and Thôndaung Police stations in the Maymyo Towship were abolished. Outposts that were abolished in 1916 were Môndaw in the Amarapura Township, Ônhmin in the Madaya Township, Malègyi and Kyetpabo in the Singu Township, and Nyaungbaw and Nalin in the Maymyo Township.

A list of Police-stations in 1886 included the following:—

18 Police-stations in Mandalay Town.

6 Police-stations in Mandalay Cantonment.

Alaunggyun Township ...	...	Damagyun. Nandagyun.
Kutywa-Taungbyôn Township	...	Kabaing. Shwegyaung. Taunggaing. Shinhla.
Madaya Township ...	...	Myoma. Myoôk's *win*. Thayèzu. Lamaing.

Lamaing North Township ...	Patheingyi. Kyaukthanbat. Yankintaung.
Lamaing South Township ...	Aungbinlè. Shindawkôn. Tadaingshe. Onhnè.
Amarapura Township	Myoma. Wadan. Myaungyaw (?) not identifiable.
Tamôkso Township	Tamkôso. Môndaw. Migyaungdet. Kywetnapa.
Singu Township	Myoma. Yenatha. Mwebôngan. Sèthi.

Apparently the Maymyo Subdivision was still in occupation by Military forces in that year. The strength of the force was 980 of which 250 were armed with smooth bores. The reason given for the issue of smooth bores was that Burmans preferred them as they were easier to keep clean.

Police Training School.

The Provincial Police Training School is situated at Mandalay. The staff consists of a Principal of the rank of a District Superintendent of Police, assisted by four Instructors in Law, two Drill Instructors, a Finger-Print Instructor, two Law Instructors (Mandalay Advocates), a Hindustani Munshi and a Burmese *Saya*. All Assistant Superintendents on first appointment are posted to the School for training. The school accommodates 125 cadet Sub-Inspectors (temporarily increased to 200 for 3 years). These cadets join the school in two batches a year, on the first of January and June. Their courses end and their final examination is held in October of the same year and in April of the following year.

The number of cadets who have passed the final examination during the last five years are:—

1920	...	38	only one examination a year held prior to 1923.
1921	...	83	
1922	...	114	
1923 April	...	75	
October	...	35	
1924 April	...	54	
October	...	37	
1925 April	...	31	

Mandalay is the Headquarters of a Military Police Battalion. It is in charge of a Commandant, aided by an Assistant Commandant. The sanctioned strength at headquarters is 470 Infantry and 60 Mounted Infantry. There are no other Military Police Posts in the Mandalay District, the posts of Maymyo and Madaya having been abolished in 1924. **Military Police.**

Mandalay possesses a Central Jail situated in the north-west corner of the Fort. It is in the charge of a Superintendent who is always an officer of the Indian Medical Service. The staff numbers 73 (1924 figures). There is accommodation for 1,333 prisoners and the average daily popula ion in 1924 was 1,315 against a mean for five years of 1,207 The death rate per thousand in 1924 was 23·57 with a five years mean of 23·43. Five executions were carried out in 1924, the annual average for the last five years being 3. The expenditure in 1924 was Rs. 1,51,684 and the cash earnings Rs. 15,121. The average cost to the State of maintaining a prisoner over the last five years has been Rs. 110-10-0, and his average cash earnings have been Rs. 18-10-0, the average net cost of maintenance being therefore Rs. 92 per annum over that period. The average percentage of Burman prisoners during the same period has been 81·5 and of non-Burmans 18·5. Seventy-two per cent. of the total number of prisoners were literate compared with a percentage literacy of 74·5 for the same proportion of Burman and non-Burman males over 15 years of age in the Mandalay District (1921 Census). **Jail.**

Maymyo is the Headquarters of the Burma Independent District (2nd Class), and the station of the General Officer Commanding. His staff consists of two General Staff Officers (2nd and 3rd grade) an A.A. and Q M.G., a D A.A.G., A.D.D.A. and T., C.R.E., A.D.S.T., A.D.M.S. D.A.D.H. and D.A.D.P. One Pack Battery, one British Infantry Battalion (less detachment) and two Indian Infantry Battalions are stationed at Maymyo. Mandalay was once the headquarters of a Brigade but is now no longer so; the headquarters of the Burma Sappers and Miners, a detachment of the British Infantry from Maymyo, and two Indian Infantry Battalions are stationed there. It is also the headquarters of the Upper Burma Battalion of the Auxiliary Force. **Military.**

The Marine workshops at Mandalay Shore date from the time of King Mindôn and many of the machines, of French manufacture still in use, date from pre-annexation days. **Marine Transport Office and Marine Workshop**

During the advance of the British flotilla on Mandalay, many of the King's steamers were captured and were afterwards embodied in the Royal Indian Marine and Burma Government flotillas. The R.I.M.S. "Sladen" which had been King Thibaw's chief vessel was sold out of the service as recently as 1923. Mandalay has always been the chief port in Upper Burma for the Burma Government's launch flotilla and is in charge of a Marine Transport Officer who is an officer, generally of Commander's rank, of the Royal Indian Marine. An Engineer Officer from the Royal Indian Marine of the rank of Engineer Commander is the Superintending Engineer of Government launches and vessels in Upper Burma and is also in charge of the Marine Workshops. There is a patent slip capable of docking all but the largest of the Government vessels and which is used for the repair of all launches stationed in Upper Burma. There is also a Marine Store Godown. A Saw-mill which was worked by the Marine Department was sold in 1925.

All launches in Upper Burma are under the professional control of the Marine Transport Officer who recruits their crews, supplies them with stores and is responsible for their annual overhaul. The are 29 steam launches, 4 motor launches, 1 rock-smasher and 10 flats based on Mandalay, of which 4 steam paddlers, 8 sternwheelers, 1 rock-smasher and 9 flats are under the direct orders of the Marine Transport Officer, the remainder being at the disposal of various District Officers. Regular services are maintained by the Marine Transport Officer between Mandalay and the Upper Chindwin and Mandalay and Bhamo, by which Government Stores, specie, prisoners and police escorts are regularly despatched. The Marine Transport Officer also supervises the River Conservancy of the Chindwin above Monywa and of the Irrawaddy above Bhamo. The value of repairs carried out by the Marine Workshops varies between one lakh and half a lakh of rupees per annum. The Store godown has a turnover of about a lakh per annum.

...siasti- ...Roman ...olic.

The earliest Catholic missionaries to this district were Barnabite Fathers. Fr. San Germano reached Rangoon in July 1783 and went straight to Amarapura. He therefore arrived soon after the occupation of the new capital, which happened, as he says in his book, on the 14th June 1783. He soon returned to Rangoon, and his place was taken by

Fr. Marcello Cortenovis. Bishop Gaetano Mantegazza died at Amarapura on the 4th August 1794, at the age of 49, and was buried there. His headstone can still be seen in the old grave-yard at the south-east of the town. From a letter of Fr. Joseph d'Amato, written in 1822, it appears that a church and house had been built. Fr. d'Amato was eventually the only European priest left in the country; because, in consequence of the dissolution of religious congregations under the French occupation of Italy, the Barnabite Fathers had not been able to supply the wants of the Mission. In 1830, the matter was taken in hand by the Propaganda, who sent out a fresh supply of missionaries. Between 1833 and 1837 (the year of the re-occupation of Amarapura) Fr. Nicolas Polignani and Fr. Ignace Storck were in charge of the Mission at Amarapura. In 1840, the mission was handed over to the Oblats de Marie Immaculée, a religious body founded at Piedmont. Fr. Paul Abbona came out from Turin and went to Amarapura, where in 1839 Mr. Camaretta, a Portuguese gentleman from Goa, built a church for him, dedicated to St. Peter. Before completion this was twice destroyed, once by earthquake and once by fire, but the whole cost was borne by Mr. Camaretta. This gentleman at the time held the office of *Shabunder* or Superintendent of the Port of Rangoon. In 1852 this church was looted and the sacred ornaments scattered in the streets. Fr. Joseph Enrici, who was also in Amarapura in 1840, died in 1841 and was buried beside Fr. Joseph d'Amato in the grave-yard at Mônhla. They were succeeded in 1845 by Fr. Vincent Gabutti and in 1853 by Fr. Ferdinand Andreino. In 1850 the charge of missions in Burma was transferred to the Society of Foreign Missions at Paris.

When Mindôn *min* shifted the capital to Mandalay Fr. Abbona obtained two sites, separated only by a road, one for a church and clergy house and one for the houses of the Christian converts. The church was dedicated to St. Peter like the Amarapura church which it replaced. It was built of teak, with good interior decorations, and lasted till 18,1; when it was dismantled and moved to a site near the General Hospital, and there was rebuilt as the Church of St. Francis Xavier for the use of the Tamil Christians. In its place a brick Cathedral was built at the expense of a Burman Christian and his wife and dedicated to the Sacred Heart of Jesus. The names of the clergy who have held charge since the Christian Community

moved with the rest of the population of the capital from Amarapura to Mandalay, are as follows:—

Bishops.

Charles A. Bourdon, 1873-1887.
Adrien Pierre Ferdinand Simon, 1888-1893.
Antoine Usse, 1894-1899.
Eugéne Charles Foulquier, 1906.

Priests.

Vicar	...	Paul Abbona,* 1860-1872 (left for Italy)
Curate	...	Auguste Lecomte, 1860-1872.
Vicar	...	Auguste Lecomte, 1872.
Vicar	...	Achille Duhand, 1875.
Curate	...	Joannes Baptista,† 1875.
Vicar	...	Joannes Baptista,† 1878.
Vicar	...	Ferdinand Simon, 1883.
Vicar	...	Tobias, † 1884
Vicar	...	Emile Fercot, 1885.
Vicar	...	Antoine Usse, 1886.
Vicar	...	Ferdinand Simon, 1887.
Vicar	...	Achille Duhand, 1888.
Vicar	...	Octave Huysman, 1894.
Curate	...	F. Paul,† 1894.
Vicar	...	Eugène Foulquier, 1899.
Curate	...	*F. Paul,† 1899.*
Curate	...	Auguste Darne, 1901.
Vicar	...	Auguste Darne, 1906.
Curate	..	F. Paul,† 1900.
Procurator		Léonce Ghier, 1910.

All the others came from the Society of Foreign Missions. In 1911 a new parish, that of St. Michael, was formed for the Burman Christians, with Fr. Paul in charge. The Anglo-Indian Christians continued to attend the services in the Cathedral.

The Tamil Mission was started in 1888 by Fr. Boulanger and carried on by Fr. Richard in 1890. In 1893, Fr. Richard having left, Fr. Boulanger again took charge, and built the Church of St. Francis Xavier with materials from the old Cathedral, many of which had come from the still older Church at Amarapura. In 1895 Fr. Boulanger left;

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* Oblate of Mary. † Native Priest.

the names of the priests who have held charge of the parish since that date are :—

Fr. Moysan, 1895-1897.
Fr. Darne, 1897-1901.
Fr. Delort, 1901-1902.
Fr. Hervy, 1902.

The number of Christian Tamils in Mandalay decreased when the British troops were transferred to Maymyo in 1905.

A Mission for the Chinese of Mandalay was started by Fr. Simon before 1886, and several converts were made, but by 1893 none of them remained. To Fr. Léon Lafon, who came from Penang in 1894, was entrusted the task of restarting the work, and it is he who has made St. Joseph's Chinese Mission what it is to-day. He founded an orphanage and a school, which has now 11 teachers and 200 pupils. In 1914 a new Church was begun in China Street; owing to the war the work was stopped, but it was started again in 1924.

In 1891 Fr. Wehinger founded St. John's Leper Asylum, which now holds about 250 lepers, looked after by 22 Franciscan Missionary Sisters with a doctor and Superintendent. There is also a school for the children of lepers, with 93 pupils.

The Sisters of St. Joseph have a Convent in the Cathedral Parish. There are 14 Sisters who with 8 teachers, maintain a school for 330 European and Anglo-Indian girls; there are also 7 Sisters who, with 6 teachers, have an Orphanage for 142 children and a Home for 58 Aged Women. These Sisters of St. Joseph came to Mandalay first in 1864, and opened a small Orphanage for Burmese girls. In Maymyo they started in 1908 another Convent and School with 8 Sisters in charge; there are now 13 Sisters and 180 pupils.

In 1897 St. Peter's High School was opened by the Christian School Brothers with 5 Brothers and 80 pupils; there are now 6 Brothers, 11 teachers, and 350 pupils, of whom 130 are boarders.

For Tamils there are, in Mandalay, a Boys' School with 10 teachers and 160 pupils, and a Girls' School with 7 teachers and 87 pupils. In Maymyo there is a Boys' School with 3 teachers and 86 pupils. A new Church of St. Peter has been built in Amarapura, and was dedicated in 1922.

There is also a Seminary, or Theological School, in Maymyo, for the training of native priests.

hurch of ngland.

Before the annexation English members of the Church of England resident in Mandalay were dependent for Church Services upon the S.P.G. missionary Dr. Marks who styled himself "Minister of Mandalay." Later the Rev. C.H. Chard signed himself as "Chaplain to the Residency." After the annexation the Church of England Chaplain to the troops, the Rev. J. Colbeck of the S.P.G., held service for a time in King Thibaw's monastery and afterwards in the Throne Room of the Palace. Later a Town Chaplain, provided by the Additional Clergy Society held services in Christ Church until Saint Mary's Church was built on the South Moat Road in 1902. The building of a large Church for the use of the troops was planned after the South African War and a fund was raised for this purpose; the building was actually begun but was abandoned when Maymyo became the military headquarters of Upper Burma. After the transfer of the Chaplain to the Troops to Maymyo the Town Chaplain ministered to all English residents of Mandalay, including the detachment of British troops until his charge was converted into a Government Chaplaincy.

In 1914 it was decided to erect in Maymyo a Memorial Church in memory of all those who had died in the service of the Province. The fund that had been raised in Mandalay became the nucleus and Rs. 74,000 in all was raised. In 1915 All Saints Memorial Church was consecrated by the Bishop of Rangoon (the Right Rev R. S. Fyffe). At about the same time a Garrison Church was built in Maymyo Cantonment for the use of the troops at a cost of Rs. 93,000; Mr. Seton Morris was the architect of both Churches. St. Michael's Girls' School in Maymyo was founded by the Sisters of the Church at Kilburn, London, for Anglo-Indian girls. The foundation stone was laid on St. Michaels's day 1901 and was dedicated by Bishop Knight on the 4th of July 1902. It has 280 pupils.

ociety for he Propagaion of the Gospel.

The Mission work of the Church of England was started in Upper Burma by Society for the Propagation of the Gospel. One of the sons (the Thônze Mintha) of the King of Upper Burma was a fugitive from Mandalay and fled to Rangoon, where in 1863 he met the Rev. J. E. Marks and made enquiries about the Christian religion. Some years later, he became reconciled with his father, and on his return to Mandalay invited Dr. Marks to visit Upper Burma. After correspondence with the British Resident in Mandalay (Col. Sladen), and with the Bishop of Calcutta, Dr. Marks accepted the invitation and went to Mandalay

in 1868 where he was warmly welcomed by King Mindôn, who volunteered to build for him a house, a school, a boarding house and a church, entirely at his own cost. The offer was gladly accepted and the school, known always as The Royal School, was opened in 1869, six of the King's sons, including Prince Thibaw, attending daily with due pomp and ceremony. The Church of our Lord Jesus Christ, to which Queen Victoria gave the font, was the largest and most elaborate building. This was begun in 1870 but was not finished until 1873, when it was consecrated by the Bishop of Calcutta, (Bishop Milman).

Mission work in Mandalay did not continue, however, very happily, for King Mindôn soon found that he did not get the political advantages that he expected, and sent a message to Dr. Marks "that it would not be safe for him to stay longer in Mandalay." Dr. Marks was therefore recalled in 1875 and the Rev. James Colbeck took his place. Colbeck stayed until the death of King Mindôn, but the massacres in the palace and the troubled state of the city made it necessary for all British subjects to leave, so in 1879 the Mission was evacuated and the buildings remained unused for several years.

When Upper Burma was annexed on January 1, 1886, Colbeck came up with the troops and soon had the buildings cleared and reopened. A considerable number of Burmans wished to join "the English religion," and it must have been extremely difficult to sort out the genuine enquirers. Colbeck however was a man of exceptionally devout life and made a great impression on the people, and several of those baptised by him are excellent workers today. Colbeck's death in 1888 was a great blow, but he had been in the country 15 years without a furlough, and died suddenly on returning from a visit to Madaya.

From 1888 to 1904, the Mission at Mandalay had a very chequered career. The Church at Madaya built in 1889 was closed for some years.

In 1904, the idea was started of forming a band of celibate clergy on brotherhood lines to work amongst the Buddhist people, and it was settled that their headquarters should be at Mandalay. This brotherhood was called The Winchester Brother-hood because some members of the Winchester diocese asked to be allowed to contribute to the work. [The first Bishop of Rangoon (consecrated 1877] had been a Canon of Winchester before his consecration, and from the starting of the see of Rangoon,

the people of Winchester diocese made themselves specially interested in Burma, sending their contributions through the S.P.G.]. The Rev. R. S. Fyffe (consecrated fourth Bishop of Rangoon in 1910) was the first head of the Winchester Brotherhood and was soon joined by the Rev. C. E. Garrad and the Rev. F. R. Edmonds. From that time, the work took a new lease of life and went on well until the outbreak of the European war, since which time, the Brotherhood has been reduced in numbers and at the present moment there is only one survivor.

Mr. Fyffe soon decided to start work also amongst the women of Mandalay; and in 1908 Miss Patch came out to be the Head of the Women's Community. The Ladies' work has gone on steadily ever since and has mainly taken the form of medical work amongst children. The Queen Alexandra Hospital for children was built in 1921 and is now endowed and has an English Lady doctor, English sisters and Burmese nurses, and is doing very valuable work.

Although there is now only one English priest in the Brotherhood, he has as assistants two Burmese priest and two Tamil priests, all trained in the Mission. There are churches at Maymyo and Madaya with regular services. There is also the Diocesan Divinity school for training native clergy. The Royal School has 220 names on the roll. There are flourishing vernacular schools at Maymyo and Madaya, and the ladies have a vernacular girls' school in Mandalay. Roughly speaking there are about 1,000 baptised adherents of the Mission, of whom some 450 are communicants.

Wesleyan Mission.

Work under the direction of the Wesleyan Methodist Missionary Society, London, was started in Mandalay soon after the annexation in 1886. The Revs. W. R. Winston and J. M. Brown, missionaries of the Society, who had worked in Ceylon and India respectively, were sent by the Society to report on the advisability of starting work in Upper Burma. They arrived in Mandalay towards the end of 1886 and were there met by Rev. J. H. Bateson who had arrived three weeks before, having come in the capacity of Wesleyan Chaplain to the Army in Upper Burma. Their first quarters were in one of the buildings attached to a Buddhist Monastery. Having received sanction from the Society in London to establish a Mission in the city, Mr. Brown returned to Calcutta and Mr. Winston, who was appointed to the charge of the work, after a

period in hired houses, secured a site for Mission premises, five and a half acres in extent. Steps were then taken to augment the staff, and in September 1887 two Singalese preachers from Ceylon joined Mr. Winston. In 1888 Rev. A. H. Bestall arrived from England as the second European Missionary.

In addition to the plot of land referred to above, a further plot was obtained near the South Moat Road and here the Boys' Anglo-Vernacular School, which was started in 1887 and carried on in a hired building near the bazaar, found its first permanent home. The School building also served as a Church where Burmese, Tamil and English Services were held. One of the most important enterprises of the early days was a Boarding School for Girls, the Wesleyan Mission being the first to establish such an institution for girls in Mandalay. This school is now housed in extensive premises in the Civil Lines, teaches up to the Anglo-Vernacular Seventh Standard and has an enrolment of over 150 pupils.

In 1896 a new church was built in the South Moat Road to provide for the growing Christian Community connected with the Mission. In 1912 new buildings were put up for the Boys' School, which had been raised to a High School, on the site adjacent to the South Moat Road. In addition to the Anglo-Vernacular Schools two Vernacular Schools, one in Thamidawze Quarter and one in Mahazeyatôn Quarter, are carried on by the Mission.

Soon after his arrival in Mandalay Mr. Winston was specially impressed by the large number of lepers seen in the streets and pagodas. In 1890 he approached the Chief Commissioner with a proposal to open a refuge for lepers. There was nothing of the kind in Mandalay and Government encouraged the proposal. The Mission to Lepers was communicated with and immediate help was promised. Thus the Home for Lepers, situated on the Mandalay-Maymyo Road, was established. The first ward, bamboo walls and thatched roof, was erected in January 1891 and into this refuge the first inmates were piloted after much argument and persuasion. When confidence was established the numbers grew rapidly, hardly a year has passed without new buildings being put up, and today there are some two hundred inmates housed in ten substantial well-equipped wards. Considerable impetus has been given to this work by the new methods of treatment now in use.

There is a hostel for untainted children of leper parents, situated in the Mahazeyabon Quarter.

In addition to missionary, educational and philanthropic work the staff of the Mission also ministers to the English and Anglo-Indian residents and to the Wesleyan troops stationed in Mandalay and Maymyo.

The numerical returns of the Mission in the Mandalay District for the present year (1925) are Christian Community 379; Boys' High School 347 pupils; Girls' Middle School 152 pupils, Vernacular Schools 113 pupils; Leper Home 192 inmates.

American Baptist Mission.

Dr. Judson, of Dictionary fame, was the pioneer worker of the American Baptist Mission in Upper Burma. Although not stationed in the Mandalay District he was with Gouger, Laird, Lanciego and others, imprisoned at Ava during the First Burmese War, and was transferred to Aungbinlè. They crossed the bridge over the Myitngè and went towards Amarapura. Laird's account of the journey is as follows: "We were stripped of all our clothes except a pair of trousers and a shirt: a rope was tied round our waists and we were bound two and two. A keeper who had a rope two or three fathoms long fixed to each prisoner, drove us along: and in this manner, in the hert of the sun, and in the month of May, we travelled, bare footed and bare headed, to Amarapura. At this place, our feet being blistered and cut, and being no longer able to travel, we were put in irons and sent in carts to Aungbinle." They were confined in a *zayat* "on a small plot of low grass, forming part of an extensive plain in rice cultivation." Mosquitoes plagued them and "when the sluices were opened to irrigate the parched fields, vermin and reptiles of all sorts which did not wish to be drowned, sought a refuge on this the only dry spot of land they could find." Mrs. Judson, who had come out to be near her husband, and her baby both developed small-pox but soon recovered. Judson himself was attacked by fever. A lioness was brought in a cage and starved to death in front of their prison. The reason for this was not ascertained, one conjecture was that, the lion being the British emblem; the treatment it received arose from a superstitious desire to degrade it. Gouger believed that he and the other prisoners were at first destined to be thrown to the lioness to be devoured, but that the authorities changed their minds. After the lioness' death, Judson obtained permission to live in her cage. In December he was taken away to

act as an interpreter in the negotiations with the advancing British army.

The American Baptist Mission began work in Mandalay in April 1886, when Rev. E. O. Stevens came to arrange for the coming of Dr. and Mrs. E. W. Kelly in June. That year Dr. Kelly bought a compound and built a Mission Residence. He next organized the Boys' School, secured a compound and erected a school house in 1887. The Girls' School, separated in 1889, moved to its present location. Missions at Aungbinlè and Amarapura were opened and work at Thayéze, with a residence in the Fort, soon followed. In 1890 the Boys' School building and the Judson Memorial Church were erected and in 1898 the Boys' School opened a High Department. The Mission Press early appeared in Mandalay and work was undertaken at Maymyo.

The European School, now St. Mary's, was opened by Baptists but was sold in 1919. The residence in the Fort was also recently sold. Work among the Chinese has been undertaken, and in 1917 the Girls' School opened a High Department.

Since 1920 new buildings have been put up for the Press, a chapel at Aungbinlè, a residence at Thayèze, a Chinese Church, and several buildings at the Girls' School and at Maymyo. A Mission Residence has been purchased in Mandalay, the Boys' School has become the Kelly High School, while the enrolment in the two schools has grown to over 800 students.

Income T[ax].

The Income Tax Act, which previously had been in force only in Mandalay Town, was in 1923 extended to the whole of the Mandalay District. From May 1924 a whole time Income Tax Officer was posted to Mandalay. Prior to this the Headquarters Assistant had discharged the duties of Income Tax Officer.

Trade Registra[tion].

There is a Registration station where trans-frontier trade from the Shan States is registered at Maymyo, in charge of a clerk. The Supervisor of Stations in the Mandalay and Kyauksè Districts has his headquarters in Maymyo. Statistics concerning the volume of trade will be found in Chapter VI.

Local F[und] Audit.

A senior auditor and three auditors of the Local Fund Audit Department are stationed in Mandalay. Their jurisdiction is the Mandalay District, exclusive of the Maymyo Subdivision, and also Lashio Town. Eight Local Funds in this District are audited by them.

TRANSFERRED DEPARTMENTS.

lic rks partment ads and ildings.

The Mandalay District is divided between two Public Works Divisions, each in charge of an Executive Engineer. The Mandalay Division, with headquarters at Mandalay, is divided into four subdivisions, North, South and College in the Mandalay District, and the Kyauksè Subdivision. The Maymyo Division has its headquarters at Maymyo and has three subdivisions, Buildings, Roads and Waterworks. The headquarters of the Superintending Engineer, Mandalay Circle, are at Maymyo. The Superintending Engineers, North-East and River Circles are also stationed at Maymyo.

ricultural partment.

The history of the activities of the Agricultural Department in the Mandalay District dates from the year 1906, in which year land for an experimental farm, of an area of 414 acres, was acquired by Government. This farm was intended to form part of a scheme for an Agricultural College, and in 1906 two agricultural experts were engaged, a Principal for the College and an Agricultural Chemist. As the scheme was postponed for financial reasons, the Principal was posted as Deputy Director in charge of the Northern Circle and the farm became the Central farm of that Circle. The necessary buildings for the farm and accommodation for the staff were completed in 1910 and a laboratory for the Chemist was erected in 1911. Although the scheme for an Agricultural College had to be kept in abeyance until the end of the War an extensive programme of Agricultural experiments was begun by the Deputy Director on the farm and a programme of research work was taken up by the Chemist in his laboratory. The work of the farm, as the latter is in an irrigated paddy tract, was concentrated mainly on the improvement of the quality of the paddy varieties grown in the Mandalay and Kyauksè Districts. Several important selections were made of which the two most successful have been "*Theikpan Ngasein and Theikpan Taungdeikpan*" the Burmese word "*Theikpan*" being employed as a generic name for the new varieties of the Department. These varieties have since been distributed widely in both the Kyauksè and Mandalay Districts and if kept pure, fetch a premium averaging Rs. 10 over unselected paddy. In addition important work was done on crops like jowar, gram, wheat and the various kinds of beans, the farm functioning as the central botanical station of the Department in Upper Burma. Considerable quantities of the seed of a short-

lived jowar, known as Saccoline, have been distributed in various Upper Burma districts, while the experiments with gram, supplemented by those at the Padu Agricultural Station subsequently opened in the Sagaing District, have enabled a variety immune to the fungus disease which attacks the old variety to be isolated. The seed of this has been extensively distributed in all the gram-growing districts and the new variety has almost completely ousted the old. Experiments with wheat consisted in conducting tests of indigenous and exotic varieties and in the introduction to Burma of several new varieties such as Pusa 12 and Federation which have since found favour in the Shan States.

The Agricultural Chemist conducted an extensive series of researches on the prussic acid content of Burma Beans, the silt content of the Irrawaddy river and on the soils of Upper and Lower Burma. Later important work was done on the paddy par-boiling industry with the result that a method of par-boiling was devised by the Chemist which has enabled the industry to be carried on without giving rise to the obnoxious odours which constituted in many parts a public nuisance.

When Sir Reginald Craddock became Lieutenant-Governor in 1917, he at once proceeded to give orders for the reorganisation of the Agricultural Department on a much larger scale than had hitherto been attempted. The first step and the central pivot of his new scheme was to revive the old scheme for an Agricultural College. Accordingly design for a new Agricultural College were prepared in 1918 by the then Government Architect, Mr. T. O. Foster and administrative sanction to the construction of an Agricultural College and Research Institute at Mandalay at an estimated cost of Rs. 11,65,000 was given in 1919, the Government of India contributing six lakhs towards the cost. Owing to the rise in the price of materials this estimate was considerably exceeded and the total cost of the College and Hostel is Rs. 15,82,221.

The new College was opened by His Excellency the Governor of Burma, Sir Spencer Harcourt Butler, G.C.I.E., K.C.S.I., I.C.S., on the 22nd December 1924. Prior to the opening, 24 students with High School Final qualifications had been admitted in July of that year. The main College, which has a frontage of 480 feet, is situated on an axial line 2½ miles due south from the Kyawmo (Mingala) Gate, Fort Dufferin. The building is three storied, *viz.*, semi-

basement floor, ground floor and first floor. It has unobstructed North lighting throughout, verandahs being provided on the south, east and west only. The central feature is a large museum hall marked by a portico. The semi-basement is devoted to the Mycological and Physics Laboratories and an Examination Hall. On the ground-floor are situated the Botanical and Entomological Laboratories and the administrative offices of several of the staff. The Library Reading rooms occupy part of the basement and ground floor. On the first floor are accommodated the Chemical Laboratories and Lecture rooms and laboratories for Agriculture, Engineering and Veterinary Science. The research aspect of the institution has been kept in view from the first and in the College building 57 per cent. of the space is devoted solely to research work. The student hostel is situated a little to the south-east of the College and has accommodation for 84 students. There are also houses for the staff and subsidiary outbuildings. A scheme for a Model Dairy has been worked out but is at present in abeyance. In connection with the College Estate further areas had to be acquired and the total area acquired up to date is, from the latest survey, 738·80 acres of which 159·86 acres are occupied by roads and buildings.

The course of studies lasts for three years with the High School Final as the initial qualification leading to a Diploma in Agriculture. There will be two examinations for the Diploma. In the first of these students will be tested in the basic sciences relating to Agriculture, *viz.*, Mathematics, Physics, Botany and Chemistry. Instruction and examination in English will also form part of the course. In the final Diploma examination students will be examined in Agriculture, Engineering, Agricultural Botany including Plant Breeding, Agricultural Chemistry, Entomology and Mycology.

The staff of the College consists of a Principal who is also Professor of Chemistry, Professors of Agriculture and Botany and Lecturers in Entomology, Mycology and Engineering.

cise. In charge of Excise administration is a Superintendent of Excise. He is assisted by four officers of the rank of Assistant Superintendent or Circle Inspector who are in charge of four circles, one Distillery Officer of the rank of Inspector, 2 Resident Excise Officers (Inspectors or Deputy Inspectors) and 11 Sub-Inspectors. Messrs. Dyer, Meakin and Company's Distillery works under the Contract

Distillery system whereby issues are made to warehouses at Bassein, Myaungmya, Henzada, Katha, Akyab, Kyaukpyu, Sandoway and Thatôn; issues of reduced spirits are made direct to country spirit shops in the Mandalay, Toungoo and Magwe Districts. In the Mandalay District there are 11 toddy shop licenses, 3 Country spirit shop licenses, 2 hotel licenses, 6 public house and 15 wholesale vend licenses. Smuggling of opium is rife along the Shan States border and finds its way to Mandalay, chiefly down the Maymyo-Mandalay road; it is also brought across the hills into the Patheingyi and Amarapura Townships and also down the Chaungmagyi and along the Mandalay Canal. Seizures made by the staff of the Excise Department in 1924-25 totalled 33,929 tolas of opium, 1,351 tolas of ganja and 494 gallons of liquor. Two hundred and eighty-two persons were arrested of whom 224 were convicted in the Criminal Courts. Rs. 18,406 were paid in rewards. There is practically no illicit trade in morphia or cocaine in the district.

Veterin: Departn

Mandalay is the headquarters of a Superintendent and a Deputy Superintendent of the Veterinary Department. The jurisdiction of the former covers the whole of the Mandalay and the Sagaing Civil Divisions and the Toungoo District, while the latter holds charge of the Katha, Bhamo and Myitkyina Districts as well as the Mandalay District. There is an Inspector for the Mandalay District with a Reserve Veterinary Assistant and each of the five Townships has a Veterinary Assistant in charge.

During the past five years there have been two epidemics of Rinderpest, in 1920-21 and in 1924-25 with 239 and 457 cases; a few cases only occurred in 1921-22-23. Foot and Mouth disease was prevalent in 1921-22 and again in 1924-25 with 1,057 and 1,072 cases, while Blackwater has taken its toll in the same two years with 32 and 97 cases; there was one case of Anthrax in 1924-25. In the years 1920-21, and 1924-25 inoculation against Rinderpest during epidemics evidently saved the lives of many cattle, as 3,319 and 3,353 inoculations were carried out and of such inoculated cattle only 57 and 20 died. During 1924-25, 3,980 animals were treated for all diseases of which 3,698 were cattle. The Assistants of the Department made 1,634 vists to villages

Saunder Weavin Institute

In 1910 Mr. L. H. Saunders, I.C.S., sometime Judical Commissioner, brought a sley from England and had it fitted to a loom and used for demonstration. After some

enquiry about the best form of improvement for Burmese handlooms, a small school of instruction was started in 1911 or 1912 in the compound of U Pe Ôn, at Lezu, Amarapura, and was financed by a Co-operative Society. The present Saunders Weaving Institute, finally established as a result of the interest in the improvement of handloom weaving taken by Mr. Saunders, began work in 1914. The ultimate aim of the Institute is to confine itself to the training of students to enable them to become teachers, managers of small factories and master weavers, and to leave instruction in ordinary weaving to District Council Weaving Schools; but pending the institution of such schools there is a lower course of one year as well as a master weavers, course of two years carried on at the Institute The courses are both practical and theoretical, repairs to the machines and designing being taught. The students of the lower course are given instruction in the use of improved wooden hand looms and preparatory appliances but in the higher course instruction in the use of Hattersley iron looms (worked by hand power) and in the use of various kinds of hand loom sleys with double and multiple box attachments and other appliances such as dobbies, Jacquards, etc., is given. The necessary qualifications for the higher course are a skilled knowledge or weaving and an educational standard equivalent to at least Seventh Standard Vernacular. An elementary knowledge of weaving is required before admission to the lower course. Examinations are held at the conclusion of both courses. Candidates for admission are required to guarantee that they will complete the course and afterwards will utilize the knowledge they have gained. A certain number of stipends of Rs. 25 are given to students of the higher course and stipends of Rs. 15 are given to all students, if not resident in Amarapura (Rs. 10 if resident elsewhere in the Mandalay District). There is a hostel supervised by two matrons for women students. Loans bearing interest at 6¼ per cent. are granted to passed students by Government to enable them to purchase looms. There is accommodation for thirty students in the lower course and for forty, twenty in each year, in the higher course. During the past five years an average of 68 pupils have been trained each year.

istra-
on.

Registration was first made compulsory in Mandalay in 1887 and at that date only within the limits of Mandalay Town. At the present day the Deputy Commissioner is Registrar for the district while the Headquarters Assistant

and the Treasury Officer are Sub-Registrars for the Mandalay Cantonment and Municipality and for the Amarapura Subdivision. The Subdivisional and Township Officers, Madaya, are joint Sub-Registrars for the Madaya Township and for certain village tracts in the south of the Singu Township and the Township Officer, Singu, is Sub-Registrar for the remainder of the Singu Township. The Subdivisional Officer and the Treasury Officer, Maymyo, are joint Sub-Registrars for the Maymyo Subdivision.

CHAPTER X.

REVENUE ADMINISTRATION.

A.—Pre-Annexation; Tenures and Assessments.

B.—Post-Annexation; Rates of Land Revenue; The abortive Settlement of 1888-89; Original Settlement, 1891-93; Original Settlement of Mandalay Cantonment; First Revision Settlement 1903-05; Revision Settlement of the Mandalay Canal Tract; Second Revision Settlement and Original Settlement of Maymyo Subdivision; Thathameda; Grants of Land; Town Lands; Fisheries; Land Records.

A.—*Pre-Annexation.*

The origin of property in land in Burma is obscure. The Kings of Burma had originally personal estates cultivated by their agricultural slaves known to this day as *lamaings*. All lands cleared by cultivators were private property and were not subject to taxation. The King was, however, lord of all lands, and in the course of time, as the property of his subjects was confiscated for rebellion or other offences, the area of the Royal lands extended more and more. It is known that in the reign of the Thalun King the boundaries of all lands were laid down; those set apart for the use of *ahmudans* or soldiers in regiments were demarcated; these were described as *kyodwins*. These *kyodwins* (inside the rope measurement) were again subdivided into— **Tenures Assessm**

(*a*) *samye* (land to be eaten) from which crops were raised for the use of the *ahmudans*,

(*b*) *nemye* (dwelling lands) set apart for the dwelling houses of *ahmudans*.

The *samyes* have always been recognised as Crown lands, but the *nemyes*, on which fruit trees were planted, and which became valuable orchards, practically became ancestral property paying no revenue to the State. Patches of cultivated lands included in the area belonging to private individuals were marked out. These latter were named *kuetches* (patches). Certain lands were set apart for the exclusive use of the King. These are what is known as Crown lands and were leased out to a farmer (*akundan*) for a lump sum at so much a year. The rents of private Royal lands were collected by an official known as the *Lamaing-wun* or, where the area of these lands was small, by clerks attached to the local *wun* and known as *Lamaing-sayes*. In the reign of Bodawpaya records of all Royal and ancestral lands were made in the year 1145 B.E. and again in 1164 B.E. These records called *sittans* were kept in the *Byè-daik* and are said to have been destroyed at the time of the English occupation of Mandalay. These records were revised in 1245 B.E. when lands appropriated to the use of *ahmudans* were resumed and fixed salaries given to soldiers of regiments in lieu of grants of land. Copies of the old records are still in many cases in the hands of hereditary *thugyis*. Land revenue (*myekhun*) was raised from Crown lands and was theoretically fixed at one-fourth of the gross produce of the land. The amount paid therefore varied according to the fertility of the soil, and a system of soil classification was adopted by the Burmans under which the lands in the Mandalay District paid revenue at rates varying from 10 to 40 baskets of paddy per *pè* (1·75 acres). The classes of soil generally recognised in this district were

(*a*) *tanè-putchi*—soil formed of vegetable mould ;

(*b*) *tanè-yo*—clayey soil

(*c*) *non-mye*—alluvial soil

(*d*) *non-thè*—alluvial soil mixed with a large proportion of sand.

Disputes as to area, amount of tax and market value of grain were of frequent occurrence. These were settled in the *Lèyôn* or agricultural bureau. The assessment on land was made—

(i) according to its area, the standard measure being the *pè* (1·75 acres)

(ii) according to the fertility of the soil.

It comprised a tax on—

(*a*) *kaukkyi*, *kaing* or *ya*,
(*b*) *mayin*, *kaukti* or *yobyan*,
(*c*) gardens.

The tax on the wet weather crop, *kaukkyi*, was collected in February, while the crop was still on the ground; and that on *mayin*, including *kaukti* and *yobyan*, in May. In addition to the regular tax, there was a premium for the right of cultivation on Crown land levied at the rate of Rs. 2 per *pè*. This was called the *letsaung kye*. The taxation on each crop varied from Rs. 15 to Rs. 20 per *pè*. The irrigation cess was levied only on ancestral land at the rate of five baskets of paddy commuted into Rs. 2 per *pè*. These lands were subject to this tax only when they were irrigated from reservoirs, artificial channels and rivers controlled by the State. The cess was probably of ancient origin; it amounted to about Rs. 5,000 in this district.

The amount of *thathameda* demanded from the Mandalay District (outside Mandalay Town) in 1884-85 is given as Rs. 1,52,100; this was at the rate of Rs. 8 per assessed household in Singu Township and Rs. 10 in the rest of the district. The figures show that only 65 per cent. of the total number of households was assessed. The revenue collected from royal paddy fields, cultivated grounds and gardens in 1884 is given as 373,250 baskets of paddy and Rs. 1,52,926.

The revenue from royal lands was collected by an officer called the *lèdaw-ôk* appointed by the Hlutdaw; he was subordinate to the *kayaing wun* and the *myowuns* and took his orders from them. The title was changed to that of *lèsaye* when the king demanded the irrigation tax. The *lèsaye* or the *lèok*, the *thugyi* and the *ywalugyis* made assessment rolls showing the lands cultivated, how much proved profitable, and what the probable outturn would be; and these statements were submitted to the *wun* who checked them. The statement thus passed was forwarded by the *kayaing wun* to the *lèyôn* in Mandalay and this department conveyed the orders of the King as to the disposal of the revenue. Sometimes it was sent up in coin; occasionally orders were received to give the rice to the *póngyis*.

The tax on *theinsu ayadaw* and other Crown lands came into operation only from the year 1866 A.D. after the Myingun Rebellion. All the islands in the Irrawaddy were

considered Royal lands. The amount levied varied very greatly. From twenty-five to fifty baskets the *pè* was perhaps the general range From *Lamaing* lands worked by the King's cultivators the rate of taxation was about 20 baskets per *pè*

A similar course was usually adopted with regard to the assessment of the irrigation tax though in this case the *lèsaye* usually accepted the statements of the *thugyis* as to the lands irrigated without further reference to the *kayaingwun*.

The theory held by the Burmese Government was that all alluvial land *kaing* and *kyun* in the riverine tracts was State property. But it would seem that very often the theory did not obtain in practice and in many places riverine land undoubtedly became private property.

Wunsa or *minmye* lands paid no revenue but the *thugyisa* attached to the office of the village headman was in very many places made to pay a tax of Rs. 3 the *pè*. In the more accessible places all land measurements were made by the *myedaing wundauks* when lands were leased or given as a free gift; but elsewhere the estimate rested with the *thugyi* *Lamaing* lands near the capital were ordinary *ahmudan* lands. All *wuttagan* lands were exempted from paying revenue where they were cultivated by the villagers to whom they had been originally granted in consideration of service in looking after the particular pagoda When however the fields were worked by others a tax at the rate of five rupees the *pè* was collected. It is quite impossible to say what proportion of the collections was really spent on the repairs or decoration of the pagoda. It is clear from most of the *yazawin* that the *wutmyewun* in Mandalay spent a great deal of the money in entirely secular entertainments. It is also definitely stated that much was expended on the reception and entertainment of foreign ambassadors. The tithes were collected on the spot by the head of the pagoda-slave village who deducted the usual percentage. wgood deal seems to have been locally spent on *pwès* The rest was sent to the *wutmyewun*. What he returned for the use of the pagodas does not appear anywhere It would almost appear as if he only sent it when there was a pious king who looked after such matters or when there was a notorious need of repairs or restoration.

The Royal Gardens never paid taxes to the Revenue Officers in Mandalay. The gardens were usually assigned

to favourite queens and princesses for their use for life. The gardeners were all appointed by the King and were invested with the powers of a *thugyi*. They looked after the gardens as well as the village, when one was attached to the gardens and periodically presented the Royal Lady to whom it was granted with a portion of the produce. The office of gardener was hereditary. They were called *uyinôks* and *uyinhmus* and appointed their own subordinate *ahwans* and *daings*.

The various kinds of service land were very numerous. Technically they were all taken away in 1873 and the *ahmudans* were paid fixed salaries of Rs. 10 per mensem but practically they remained either in the hands of the original *ahmudans* or of the first occupant (*lôkyinswè*) who took possession.

The land revenue, *i.e.*, the revenue on Royal paddy lands, *ya* lands, *kaing*, *kyun* and garden lands was assessed and collected at the time when the crops could be seen on the ground. The water tax was collected once a year in the months of *Kasôn* and *Nayôn*. The *thathameda* tax was paid in two instalments the first instalment being due in *Waso* and *Wagaung* and the second instalment in *Tabodwè* and *Tabaung*.

A specimen of one of King Thibaw's budgets will be found in Appendix B, and a copy of a pre-annexation Revenue map in the pocket at the end of the Gazetteer.

B.—*Post Annexation*.

Rates of Land Revenue.

The mode of assessment of State land current in the Kutywa-Taungbyôn and Lamaing Townships and in suburban Mandalay, at the Annexation and in force up to the date when Settlement was introduced, is described by the Chief Commissioner, Sir Alexander Mackenzie, in a Note on Mr. Laurie's Settlement Report On miscellaneous crops growing on islands or alluvial lands, cash rates per *pè* (1·75 acres) were annually assessed by the *thugyis*. These rates had risen from Rs. 4 in 1150 B.E. to Rs. 17-8 per *pè* in 1250 B.E. On *ya* or upland cultivation also a cash rate was levied, varying from Re. 1 to Rs. 4 per *pè* with reference to the supposed fertility of the soil. On paddy lands the rates were extremely various, ranging in the case of *kaukkyi*, the principal crop, from Rs. 1-12 per acre to Rs. 7·30. The theory was that the cultivator paid one-fourth of the produce at each crop, which was

periodically estimated on the ground by the *thugyi* and his underlings, shortly after transplanting. The *thugyis* were supposed also to effect a rough measurement of areas, and probably did so measure irrigated paddy lands which paid only a water rate at Rs. 2 per *pè*. The state share of the estimated crop was converted into cash at so many rupees the 100 baskets. The rate of commutation was in Burmese time fixed by custom, and was, in the case of ***kaukkyi***, Rs. 80 the 100 baskets, and for ***mayin*** Rs. 60. The rates in vogue since the Annexation had been maintained at those figures, and had not varied with the changes of the market. The *thugyis* worked under no sort of supervision. They paid into the treasury what was shown in their assessment rolls, made up as they chose to present them, and they continued to do so up to the introduction of Settlement. Any attempt based on the *thugyis* returns to ascertain the real incidence per acre of the land revenue demand was therefore eminently unsatisfactory. The impression of the local officers was that the cultivators had actually paid the *thugyis* year by year very much more than had ever reached the treasury.

e abortive ttlement 1888-89.

Mr. Gibson, who conducted in 1888-89 a Settlement of the tract described above found it impossible to frame any reasonable assessment by following the Lower Burma method of deducting from gross outturn the cost of cultivation and cost of living and thus arriving at net profits. One main reason for the failure was that the average area of each holding was so small that nearly the whole population drew a large part of their income from sources other than agriculture. Mr. Gibson reverted therefore to the Upper Burma principle of taking a share of the gross produce. The result of his proposed settlement was to raise the *thugyi's* estimate of area from 13,298 to 25,543 acres and the demand from Rs. 60,436 to Rs. 1,44,174. Mr. Gibson arrived at his gross average outturns by general enquiries from cultivators and others; his crop cutting experiments were very few. His proposals were set aside because the rates were based on no accurate data and because the increase of revenue was, it was feared, larger than could safely be taken. To Mr. Westlake was given the task of ascertaining what would be the effect on individual holdings of applying a lower scale of rates proposed by the Director of Land Records, and of modifying them where they were found to press too hardly on the individual cultivators. Mr. Westlake found great difficulty in

comparing the rates proposed with the incidence of the *thugyis* assessment, and was not able to effect this throughout the tract; he finally proposed a demand of Rs. 1,00,223. The *thugyi's* themselves had brought the assessment for 1890-91 to Rs. 92,312: there was therefore no great immediate gain to be had from adopting the revised rates. It was also pointed out that the assessment would in fact be less than one-eighth of the gross produce. It was therefore decided to take no action on either Mr. Gibson's or Mr. Westlake's Reports.

Original Settlement 1891-93.

Between September 1891 and March 1893 Settlement operations were conducted throughout the Mandalay District save in the town itself and the Pyinulwin (Maymyo) Subdivision. They were begun by Mr. Westlake, who died in May 1892, and were completed by Mr. Laurie who wrote the Report. The district was divided in its paddy-producing aspect into five tracts, in accordance with the comparative advantages enjoyed by each for the production of paddy; these advantages being means of irrigation to supplement the natural rainfall, and, in a minor degree, natural fertility of soil. The Settlement Officer then proceeded to classify the lands in detail, *kwin* by *kwin*, according to their estimated or asertained capacities for producing paddy of the two staple sorts, *kaukkyi* and *mayin* including a third sort, *kaukti*. He found five descriptions of *kaukkyi* growing land, three descriptions of *mayin*-growing land, and only one of *kaukti* land, all so marked off one from the other in irrigational facilities and natural fertility that he made them into separate classes for assessment. The crop values attached to each class were as follows:—

Class.	*Kaukkyi.*	*Mayin.*	*Kaukti.*
1	60 baskets	Irrigated 40 baskets	...
2	50 ,,	Unirrigated 40 baskets	...
3	40 ,,	30 ,,	30 baskets
4	30 ,,	...	...
5	20 ,,	...	...

He adopted Rs. 80 per 100 baskets as his conversion price for *kaukkyi* paddy, and Rs. 60 per 100 baskets for both *mayin* and *kaukti*. He found it impossible to ascertain what the nett produce would be, *i.e.*, the gross outturn less the cost of cultivation, and therefore proposed to take as revenue one-eighth of the gross produce on State land and one-twelfth on Non-State land. This would have given a revenue of Rs. 1,19,268 from 33,366 acres of State paddy

land, and of Rs. 33,687 from 15,310 acres of Non-state paddy land. Mr. Laurie formed one tract for *kaing* land and another tract for *ya* land, and assumed that any non-paddy crop would, within its tract, give a yield so nearly equal in quantity, irrespective of the particular soil on which it was raised, to that given by any other crop raised within the same tract that one value and one deduced rate for each kind of crop within each of these tracts would answer sufficiently well for assessment purposes. He based his estimates of outturns on information given him by the cultivators. The rates were based on the same proportion of the gross produce as those proposed for paddy land. Rates for gardens were fixed by the tree. The result was as follows:—

	Area.	Revenue. Rs.
State land ...	69,590	1,77,637
Non-state land ...	15,736	39,560

The total demand proposed for paddy and other land was therefore Rs. 3,70,152 from 1,34,002 acres.

The Government of India, to whom the report was submitted were however opposed:—

(1) to any system of assessment on the gross assets,

(2) to the proposal that the assessment should be on the crop and not on the soil.

The Report gave rise to prolonged discussion which in 1895 was recapitulated by the Chief Commissioner in a Note recommending that the rates, as finally proposed by the Financial Commissioner, should be approved for State land only for a limited period and that in the meantime a Settlement Officer should be appointed to make a revised Settlement on the understanding that:—

(1) the assessment should be based on a share of the net and not of the gross produce;

(2) the assessment should be by a soil and not by a crop rate except in the case of alluvial lands. The Chief Commissioner's recommendation was accepted by the Government of India and the rates were notified, for a term of five years from 1st July 1896.

ginal lement andalay tonment.

In November 1894 Mr. Gibson reported on an area of 818 acres within Mandalay Cantonment. He proposed a demand of Rs. 4,720 on an area of 804 acres.

t Revi- Settle- t, 1903—

Revision Settlement Operations were commenced under Mr. Gibson in November 1903 and a report on the area

originally settled in 1892-23 (excluding the Mandalay Canal Tract) *plus* an area of 25·73 square miles of newly surveyed *kwins*, was completed in August 1905. It was proposed that the demand be raised from Rs. 3,58,389 to Rs. 3,67,462 or 2·53 per cent. The Conference recommended that the demand be raised to Rs. 3,79,902 or by 6 per cent., and this was accepted by the Financial Commissioner and the Lieutenant-Governor. Differential assessments were continued for State and Non-State land of all descriptions. Intermediate rates were notified in certain *kwins* for five years; the maximum rates were sanctioned for a term of ten years from 1st September 1906.

Revision Settlemer of Manda Canal Tr

The Revision Settlement of the Mandalay Canal Tract was not effected along with that of the rest of the district in 1903-05 because the construction of the Mandalay Canal had completely altered the circumstances and character of the tract. The Settlement Officer in accordance with instructions which were issued to him framed water rates for paddy land on the basis of one-fifth of the estimated gross produce. At the Conference held on the report it was considered that the water-rates proposed were too high and water-rates based on a one-sixth share of the gross produce were proposed by the Conference and accepted by the Local Government. The result of the application of the rates proposed by the Settlement Officer was an increase in the demand (land revenue *plus* water-rate) from Rs. 2,86,679 to Rs. 3,47,368 or by 21·17 per cent. The rates proposed by the Conference gave a demand of Rs. 3,30,714, an increase of 15·36 per cent.

Second Revision Settlemen and Original Sett ment of Maymyo Subdivisic

Second Revision Settlement Operations on the lines proposed by the Revenue Committee of 1921 were started in May 1922 and covered the whole district, including Mandalay Cantonment and the Maymyo Subdivision. An Initial Report on the plains of the district was submitted in October 1923 and a separate report on the Maymyo Subdivision in November 1924. The operations had not been concluded when this chapter was written.

Thåthamı

At the Annexation *thathameda* was assessed at the rate of Rs. 8 per household in the Singu Township, and at the rate of Rs. 10 in the rest of the district (except in Mandalay Town where no *thathameda* was demanded). After prolonged discussion proposals were submitted in 1899 for the assessment of non-State land to land revenue and for the concurrent reduction of *thathameda*, except in Maymyo Subdivision. It was assumed that the current

total assessment of the district was about all it would bear. It was also found that the non-State land revenue demand at three-fourths of the State land rates would, on the area cultivated in 1896-97, produce about Rs. 66,000. The *thathameda* was reduced by this amount, the reduced demand being distributed in direct proportion to the area of non-State land held in each township, the township being adopted as the unit for purposes of adjustment. The rates sanctioned were :—

	Rs.
Singu	6
Madaya	8
Patheingyi	9
Amarapura	7

At the Revision Settlement of 1903-05 12,550 *thathameda* paying families were examined as to their net incomes during 1903-04 from agricultural and non-agricultural sources. Then on the basis of these incomes the full Rs. 10 was divided into (1) agricultural *thathameda* and (2) non-agricultural *thathameda*. The rates proposed and sanctioned were :—

——	Singu.	Madaya.	Patheingyi.	Amarapura.
Town ...	7	9	...	9
Villages with bazaars and with a larger proportion of non-agriculturists.	6	6	6	8
Ordinary villages ...	5	5	5	6

At the Revision Settlement of 1904-06 a similar method was adopted; the rates proposed and sanctioned were :—

——	Madaya.	Patheingyi.	Amarapura.
Town	9·60	...	...
Villages with a bazaar or with a larger proportion of non-agriculturists.	6·00 to 7·00	6·00 to 7·00	...
Villages with incomes from non-agricultural sources larger than from agricultural sources.	...	5·00	5·00
Ordinary villages ...	4·00 to 5·00	**4·00**	**4·00**

In the Maymyo Subdivision the Rs. 10 rate is still in force except in two villages.

Grants of land. Fifty-seven grants of land were made between the years 1919-24 to *ex*-soldiers, mostly from the Burma Company of Sappers and Miners and from the Burma Mechanical Transport Companies. The lands are situated mainly in the *kwins* lying between the Canal and the Mandalay-Maymyo Road. These grants are non-transferable. A large part of the land granted became available on resumption from Sir Abdul Jamal when his land purchasing scheme was terminated by Government.

Town Land. Revenue is derived from lands within towns both as land revenue on agricultural land and as rents from leases. The figures for the last three years are :—

		Land Revenue.	Land Rents.
		Rs.	Rs.
1922-23	...	20,092	39,123
1923-24	...	20,789	40,231
1924-25	...	20,909	40,141

Fisheries. There are two classes of fisheries, those administered by the Deputy Commissioner and those administered by the Canal Department. A large number of the former, and those the biggest revenue producers, are to be found in the Singu Township. There are 171 District Fisheries and 11 Canal Fisheries within the District. The revenue obtained during the past three years has been—

Township.		Number.	District Fisheries.		
			1923-24.	1924-25.	1925-26.
			Rs.	Rs.	Rs.
Singu	...	77	1,18,900	1,26,088	1,31,048
Madaya	...	48	42,671	48,745	47,925
Amarapura	...	34	39,210	37,580	43,505
Patheingyi	...	11	18,690	20,760	15,560
Mandalay Town	...	1	900	1,000	1,000
			Canal Fisheries.		
		11	11,280	7,770	10,145
Total	...	182	2,31,651	2,41,943	2,49,183

Land Records.

The staff consists of one Superintendent and one Assistant to the Superintendent of Land Records, six Inspectors, fifty-five Surveyors, thirteen Reservists, Apprentices and Temporary Surveyors, and an office staff of two Clerks and two Record Keepers. The occupied area dealt with in 1923-24 was 278,364 acres of which 195,346 acres were cultivated and 180,511 acres assessed; occupation was for residential purposes on 5,138 acres and for agriculture on the rest of the area. The cost of the Land Records establishment averaged annas four per acre occupied, and amounted to 7·34 per cent. of the total assessment.

CHAPTER XI.

LOCAL SELF-GOVERNMENT.

Mandalay Municipality; Maymyo Municipalty; Myitngè Notified Area; Mandalay District Council: School Board; Circle Boards; Mandalay Cantonment; Maymyo Cantonment.

The Mandalay District contains two Municipalities and two Cantonments, those of Mandalay and Maymyo, a District Council and one Town Committee, that of Myitngè. The Mandalay Municipal Committee and the District Council are elected bodies*; the Mandalay Cantonment Committee and Maymyo Municipal Committee are partly elected, partly nominated; the Myitngè Town Committee is entirely nominated, while the Maymyo Cantonment possesses no committee but is a Corporation sole.

Mandalay Municipality. Constitution.

The Municipality of Mandalay was originally constituted in 1887 under the Upper Burma Municipal Regulation (No. 5 of 1887) and a committee of 15 nominated members, of whom 9 were officials with the Deputy Commissioner as President, was appointed on the 18th August 1887. It was reconstituted in 1898 under the Municipal Act of that year. The number of nominated officials was reduced to five and the balance of members, 12 in number, were elected on a basis of communal representation as follows :—

Europeans, Eurasians, Parsis, Armenians and Jews.	4	Representatives.
Burmans and other indigenous races.	5	Ditto.
Mussulmans	1	Representative.
Hindus and other Indian races	1	Ditto.
Chinese and other Asiatics ...	1	Ditto.

* Mandalay Municipality Committee is now partly elected, partly nominated.

The Municipal area was divided into four electoral circles for Burman candidates (one circle returning two members) while for the other communities the whole area comprised one circle. The Deputy Commissioner was the nominated President and the Headquarters Magistrate the Vice-President. The other three official members were the Civil Surgeon, the District Superintendent of Police and the Assistant Executive Engineer in charge of the Mandalay Subdivision.

The property qualifications for an elector and for a candidate were possession of immovable property within the Municipality of a minimum value of Rs. 1,000 in the first case and Rs. 5,000 in the second. Alternative qualifications were payment of a monthly rent of Rs. 20 and Rs. 50 respectively or payment of yearly rates and taxes of Rs. 10 and Rs. 30 respectively; for the Burman community however the qualifications for a candidate were the same as those for an elector. The term of office of the elected candidates was two years. The bulk of the executive work fell on the President and Vice-President but in 1921 the appointment of a Chief Executive Officer was sanctioned and the appointment was made from the 1st of April 1922.

In accordance with the policy of complete self-government announced by the Local Government in 1920, the the Municipal Committee was reconstituted on an entirely elected basis from the 1st of March 1923.* The constitution of the Committee provides for 21 elected non-official members with power to coopt three others; officials may be co-opted with the previous consent of the Commissioner but actually no official has so far been co-opted. Representation is communal and the classes have not been altered; the distribution however has been altered, giving 4 representatives to Class I, 10 to Class II, 3 to Class III and 2 each to Classes IV and V. For Class II the area is divided

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* The constitution of the Mandalay Municipal Committee has again been altered recently, *vide* Local Government (Municipal) Department Notifications Nos. 118 and 119, dated the 8th of September 1925. The committee will in future consist of 31 members, 26 being elected non-officials and 5 nominated by the Local Government (officials or non-officials). The elected members are distributed as follows Class I 2, Class II 18, Class III 3, Class IV 2 and Class V 1. The property qualification for a voter has been reduced to Rs. 200 or a monthly rental of Rs. 4 or yearly rates and taxes of Rs. 4. The qualification for a candidate is that he shall be on the voter's roll. Women are admitted as voters and candidates.

into 10 electoral circles; for the other classes there is but one circle as before. The President and Vice-President are now elected by the members of the committee from among their own number.

The property qualifications for an elector have been lowered and are now possession of immovable property to the value of Rs. 750, payment of monthly rent of Rs. 15 or payment of yearly rates and taxes of Rs. 7-8. The qualifications of a candidate remain the same; a candidate must however be a British subject or the subject of an Indian State, unless the Local Government otherwise directs. The term of office of Committee members is now three years.

[Bo]undaries [an]d popula[tio]n. The boundaries of the Municipality have not altered to any great extent from those notified in 1898. The area then was, exclusive of Cantonments, 18·51 square miles. A small extension to include part of the Irrawaddy bed was made in 1914 along that boundary which then coincided with the river bank; this increased the population by about 200 persons who lived on the river bank. The population as given in the last four Census reports was.—

1891	...	170,071
1901	...	167,721
1911	...	124,914
1921	...	134,839

(*Vide* note 16 to Table IV of the 1921 Census Tables.)

There has thus been a decrease of at least 20 per cent. in the population since the Annexation; probably considerably more as many people left Mandalay in the troublous times that followed the annexation, and before the first Census was taken there. It may be noted that the Municipal Administration Report for 1923-24 gives the population as 133,293; it is not known how this figure has been computed.

[Sta]ff. The Municipal staff is under the immediate control of the Chief Executive Officer. There are a Secretary, 2 Health officers with 4 Sub-Assistant Surgeons, 2 Engineers and 2 Sub-Engineers, 1 Veterinary Officer and 1 Fire Brigade Superintendent.

The Municipality also employs a staff of some 650 clerks, subordinates and menials divided among the following Departments:—

Office Staff.
Tax Collection Establishment.

Sanitation.
Fire Brigade.
Public Works.
Slaughterhouses.
Day Conservancy.
Night Conservancy.
Hackney Carriage Department.
Bazaar Establishment.
Veterinary Department.
Registration of Births and Deaths and Vaccination Department.
Pagoda and Cemetery Caretakers.
Cattle Pound Keepers.
Dog Poisoners.
Street Watering Department.

The Hospital Staff are now no longer under the executive charge of the Municipal Committee as a separate Hospital Fund has been constituted. The cost of the salaries of the establishment, exclusive of the Hospital Staff, in 1922-23 was approximately 3 lakhs of rupees.

Revenue Expendi[ture]

In the first year of its existence, 1887-88, the total income of the Municipality was Rs. 2,94,000 of which only Rs. 69,000 was raised by taxation. The expenditure was Rs. 2,93,000. The following table shows the growth of total income, income from rates and taxes and expenditure for the first year in each decade since that date and also for 1923-24, the last year for which figures are available (in thousands of rupees).

Year.		Income from Rates and Taxes.	Total income.	Total Expenditure.
1887-88	...	69	2,94	2,93
1890-91	...	1,85	3,69	4,63
1900-01	...	2,48	6,30	5,55
1910-11	...	3,18	8,34	8,34
1920-21	...	3,57	14,83*	11,51
1923-24	...	2,41	9,81	10,46

* Includes a loan of 4 lakhs.

It is noticeable that taxation has not kept pace with the growth of income. In 1890-91 taxation represented nearly half of the total income; in 1920-21 it brought in less than a third of the total income exclusive of the loan.

The low figure for rates and taxes realised in 1923-24 is due to large outstandings of over 2½ lakhs which remained uncollected at the close of the year. This was to some extent due to an epidemic of plague which resulted in a considerable exodus during the most virulent period. This rendered the work of assessment and collection difficult and has been a yearly experience for the last 11 years during which the average number of deaths has been over 1,000 per annum, varying from 54 in 1916-17 to 2,441 in 1923-24. Income derived from bazaars has grown from 2,c4 in 1887-88 to 5,94 in 1923-24 and exceeded 6 lakhs in 1922-23; this accounts largely for the increase in income.

Taxes now levied in Mandalay are a property tax, a lighting tax, bullock cart tax, vehicle tax, conservancy tax and water rate.

From 1889 to 1923 the tax on property remained the same with slight modification, a tax on areas covered by buildings and also on uncovered areas; the former ranged from 1½ to 4 pies the square foot, and the latter from Rs. 5 to Rs. 10 per acre; the variation was according to class of building and to situation. In 1923 the basis of assessment was changed and a tax on rental values was sanctioned from March 1st, 1923. The rate is 8% of the rental value in the area know as Civil Lines and 6½% in the rest of the Municipality. After it was introduced, this tax met with considerable opposition and during the first year less than half the demand was collected owing to the large numbers of appeals against assessments; the fact that the majority of the elected committee, newly constituted that year, was opposed to it did not facilitate dispatch in disposing of appeals against assessment nor in collection. This is the main reason for the large outstandings at the end of the year 1923-24.

The lighting tax was introduced in 1900. In the notification imposing it, the rate was fixed at 25% of the property tax then in force, that of 1895. When in 1901 a new property tax was introduced, the 1895 tax was superseded but no alteration was made in the lighting tax notification, which specifically referred to that tax. The lighting tax was however collected till 1923 without objection when the tax on rental values was introduced. The illegality of collecting the lighting tax under the authority of the old notification was then discovered and no lighting tax was collected at all for the calendar year 1923. A new tax was sanctioned from the 1st of January 1924 at the rate of 1¾%

on rental values. Although the Local Government offered to introduce in the Legislative Council an enabling bill to legalize collection of the tax unpaid in 1923, the Municipal Commtttee refused the offer and contemplated foregoing collection for that year altogether in spite of their very unfavourable financial position. Finally after some months infructuous discussion a compromise was arrived at to the effect that for two years the lighting tax should be enhanced by 50% in order to make good the amount lost in 1923.

Income is also derived from the following taxes :—Bullock cart tax introduced in 1900; conservancy tax introduced in 1904; Vehicle tax introduced in 1904 and water tax introduced in 1919. The incidence of taxation per head in 1923-24 was Rs. 1-13-0 which is rather less than two-thirds of the average incidence of Municipal taxation for the Province, Rs. 3-1-11. The incidence per head of the total income was Rs 7-2-5, the average for the Province being Rs 7-7-3.

The main heads of expenditure in 1923-24 were (in thousands of Rupees) Public Health and Convenience—6,70, of which Conservancy accounted for nearly two lakhs and the Hospital for 1¾ lakhs. This last item will be reduced in future as the Hospital finances have been established as a separate fund and the Municipality will be liable only for a fixed contribution. General Administration cost 1,16 and the Fire Brigade and Lighting 1,05. In the early days of the Municipality liability for the upkeep of the Town Police amounting to a lakh a year, was a considerable handicap. This was however removed in 1899.

Loans and Contributions.

Over the last 10 years contributions from the Local Government have averaged half a lakh a year, the largest amount, Rs. 1,81,000 being received in 1922. Of this sum Rs. 1,31,000 was given to further the water supply scheme and Rs 50,000 to meet excess expenditure on the Hospital.

There are four loans outstanding as follows :—

1903; Rs. 7,23,000 for construction of the Zegyo;
1905; Rs. 80,000 for construction of drains;
1921; Rs. 4,00,000 for the water supply scheme;
1922; Rs. 3,00,000 for various important works.

At the close of 1923-24 the outstanding indebtedness, after deducting the credit balance of the sinking fund, was Rs. 8,24,000.

An analysis of the average income and expenditure for the last 10 years shows that the former has not ordinarily been sufficient to meet the latter. (Thousands omitted.)

	Rs.		Rs.
Ordinary income ...	9,00	Ordinary expenditure ...	9,88
Grants and contributions	54	Repayment of loans ...	74
Loans ...	1,22		
Total ...	10,76		10,62

...blic works

In 1897 the old Zegyo was burnt down and the temporary structure that replaced it was also burnt down in 1903. In that year the building of the present Zegyo, a brick building, was commenced with the aid of a loan raised for the purpose. In 1905 pucca drains were constructed in certain quarters of the town, also by the aid of a loan.

The question of a proper water supply has been a hardy perennial. In 1903 an ambitious scheme involving construction of a reservoir on Mandalay Hill and costing nearly 14 lakhs was abandoned and it was not till 1914 that any further action was taken when some tube wells were sunk. The war then interrupted further work and no real progress was made till 1919 when sinking of further tube wells was put in hand. A portion of the town gets water from hydrants supplied by these wells. The report for 1923-24 informs the public that the final report on the completed water supply scheme was received from the Superintending Engineer of Public Health Department in the middle of that year and that "the Committee contemplates shortly taking up the matter of construction of reinforced concrete elevated reservoirs."

There are 60 miles of metalled roads within the Municipal area, a large portion of which are in a very indifferent state of repair owing to lack of funds.

...ymyo ...nicipality ...stitu...s.

Maymyo is named after Colonel May who commanded the 5th Bengal Infantry stationed there in 1886. In 1896 it was selected by Mr. D. M. Smeaton, then officiating Chief Commissioner, as the summer resort of the Local Government. By 1900 the railway was open as far as Maymyo and considerable building activity took place and in 1902 it was notified as an area to be administered by a Town Fund Committee. In 1904 the Army Department selected Maymyo as a permanent station for British troops in place of Fort Dufferin.

The members of the Town Fund Committee were appointed by the Commissioner, Mandalay Division; the committee consisted of the Subdivisional Officer as President, the Civil Surgeon, the Executive Engineer, Maymyo Division and a Military Officer from the Burma Division Headquarters as *ex-officio* members with prominent members of the European, Burmese, Hindu and Mussulman communities. The term of office of the latter was two years. With effect from the 1st June 1923 Maymyo was constituted a Municipality with seven nominated and ten elected members. Of the nominated members three are officials, the Subdivisional Officer, Civil Surgeon and Executive Engineer. The ten elected members represent 6 wards. There is no communal representation. The first elected President was the Subdivisional Officer but after the elections of 1925 an unofficial member was elected as President. During 1923-24 the average attendance at meetings of unofficials was 62·1 per cent and of officials 53·5 per cent. The qualifications for an elector and a candidate are the same as in all municipalities except those of Mandalay and Rangoon, and are given in Municipal and Local Department Notification No. 93, dated the 6th June 1924.

Boundaries and Population. The boundaries originally notified in 1902 were modified in 1908 and now include the whole of the inhabited area of Maymyo outside the two Cantonments. Part of the area, that of the town proper, has been surveyed on a scale of 64 inches to the mile and is known as the "block" area. The growth of population since the inception of the town has been rapid; in 1891 it was 1,665 and had increased to 6,223 in 1901 and to 11,974 in 1911; the Census of 1921 showed a population of 12,839 in the Notified Area and of 3,719 in Cantonments which previously had not been enumerated separately.

Revenue and Expenditure. The Revenue of the Maymyo Municipality in the first year of its existence, 1923-24, was Rs. 1,93,694 exclusive of an opening balance of Rs. 90,315 received from the old Town Fund; the main sources of Revenue were Rates and Taxes and fees from Markets and slaughter-houses. There was no Government grant, as in previous years, for the upkeep of the Hospital as it was taken over by Government in that year. Expenditure for 1923-24 was Rs. 1,91,90, the main heads of expenditure being General Administration, Lighting and Public Health and Convenience. The latter head showed a considerable decrease on previous years as no expenditure was incurred on the upkeep of the

Hospital. The following table shows the main heads of revenue and expenditure for the last two years and also for the year 1908-09 for purposes of comparison to exhibit the growth.

Revenue—(thousands omitted).

Year.	Rates and Taxes.	Fees from Markets, etc.	Grants.	Total.
1908-09 ...	40	53	51	1,48
1922-23 ...	98	58	1,04	2,67
1923-24 ...	1,08	62	9	1,89

Expenditure.

Year.	General Administration.	Lighting.	Public Health.	Public Works.	Total.
1908-09	11	6	1,16	11	1,34
1922-23	16	11	2,14	7	2,54
1923-24	18	15	1,16	22	1,85

Taxes.

A tax on lands covered by buildings was introduced in 1906; the rate varies from one to four pies per square foot according to situation and class of building. At the same time a tax of Rs. 3 per acre per annum was imposed on land not covered with buildings in the residential area and of Re. 1 per acre in the "Block" area.

A scavenging tax was introduced at the same time which is calculated according to the number of buckets conserved. A latrine tax of 25 per cent. of the property tax was also imposed on all houses not liable to the scavenging tax.

A water tax was imposed in 1912 on all lands that could benefit from the water works; the rate is 20 per cent. of the property tax.

Taxes on vehicles and animals and tolls on the same were introduced in 1914 and 1915. Proposals for a wheel tax and for the revision of the scavenging tax are now before the Local Government.

The incidence per head of municipal taxation is the

highest in the Province ; it was Rs. 8-7-0 in 1923-24. The incidence of income is also high, Rs. 14-11-0 per head in the same year.

Loans and Contribution.

The Municipality has raised no loans ; a proposal to raise one in 1923-24 in order to construct pucca dhoby ghats did not meet with the approval of the committee. Until 1923-24 the Local Government made a yearly contribution to meet the cost of maintenance of the Hospital and in nearly every year a further contribution of varying amount was made for general purposes. Contributions to aid Vernacular education were also received in 1922-23 and 1923-24. In the latter year the Municipality became responsible for all Vernacular education within its borders, and a sum of Rs. 3,000 in addition to a contribution of Rs. 2,316 was spent on six Vernacular schools.

Public Works.

The water works are maintained by the Public Works Department from Provincial revenues. The proceeds of the water tax, less cost of collection, are therefore credited to that Department. A new reservior has recently been constructed in the Kelaung Valley.

The town possesses a septic tank and a sewage farm for the disposal of the night soil which is removed on the day removal system. The report for 1923-24 however states that the septic tank has ceased to function. There are also septic tank latrines in the bazaar. The most congested area of the town possesses pucca drains, totalling some 12 miles in length, but the remainder of the area is served by kutcha drains.

The only pucca roads maintained by the Municipality are side roads off the main roads in the "Block" area ; the remaining pucca roads are maintained from Provincial Funds.

Electricity has recently replaced oil for road lighting to a considerable extent but has entailed increased expenditure.

At one time the Town Fund Committee possessed a model dairy farm but the 1923-24 report states that this has been abandoned and the stock sold off.

Myitngè Notified area Constitution.

Myitngè was notified as an area under the control of a Town Fund Committee in November 1915; the members were appointed by the Commissioner, Mandalay Division in December of that year. They were :—

Deputy Commissioner, Mandalay.—*President.*

Divisional Superintendent, Carriage and Wagon Department, Burma Railways, Myitngè.—*Vice-President.*

District Engineer, Burma Railways, Mandalay.
District Medical Officer, Burma Railways, Mandalay.
Subdivisional Officer, Amarapura.

The area notified included not only the Railway settlement and workshops, an area of about 566 acres, but also parts of the neighbouring village tracts including the villages of Uyindaw, Danôn, Myobyingyi and Myothit, in all an area of about three square miles. The Railway authorities, who initiated the proposal, at first wished that the Railway settlement alone should be included, but it was considered necessary for the enforcement of proper sanitary measures that the neighbouring villages should be included. The end desired however proved unattainable. Prior to the notification the Railway Company was already providing within its own area a complete system of metalled roads, lighting, pucca drains, a water supply, a hospital, a bazaar and sanitation at its own expense. In 1921 the population was 3,439, figures for earlier years are not available.

Taxes were sanctioned as follows:—

A tax on land covered by buildings at the rate of one pie per square foot.

A tax and also a toll on bullock carts.

These taxes involved the committee in trouble at an early date for the Railway Company protested against assessment of taxes on its property as it was continuing to carry out at its own expense within its own area the public services already enumerated; the money value of these exceeded the amount of taxes assessed. On the other hand, the villages which were for the most part agricultural were taxed nominally on account of these amenities in which they did not share to any extent and of the cost of which the Town Fund Committee bore no part. Again, as the Railway Company kept up all the metalled roads it was obviously inequitable to credit to the Town Fund taxes collected from bullock carts using these roads. The Railway Company, however, offered to pay 15 per cent. of the assessed taxes in return for the services, such as they were, rendered by the Town Fund. This offer was analogous to an arrangement made in Insein, but was not accepted. In 1918 the Local Government ordered suspension of all tax collection both from the Railway Company, an amount of some Rs. 3,000, and from the villages, an amount of some Rs. 2,000. This left the Town Fund Committee with an income derived from a bazaar at Sado and from a cattle pound and slaughter-house.

At the same time the Local Government reopened the question of boundaries of the area, being of the opinion that all agricultural villages should be excluded. Considerable discussion then followed during which the suggestion was made that the Railway property should be excluded from the area. Finally, it was decided to restrict the area to the Railway property and three blocks; one on the north including a new hamlet called Kalaywa where non-agriculturalists had squatted, the idea being that their actions could be more suitably controlled by the Town Fund Committee, a hope which had already been proved vain in the other villages; a block on the west that consisted of land suitable for better class houses; and a block on the south-east which contained a protective bund. All other villages were excluded and the boundaries were notified in 1922. The areas then excluded came under the jurisdiction of the District Council. In the restricted area, however, no taxes were collected and indeed the assessable value of buildings outside the Railway property was only about Rs. 100. The bazaar at Sado fell outside the restricted area as did the slaughter-house. This latter however had for some years been unused owing to dilapidation and lack of water, the licensee who bought it having recouped himself by levying totally unauthorized fees, almost a species of blackmail, from all those who slaughtered cattle themselves within a radius of five miles. This left the Town Fund Committee with the cattle pound for its sole source of revenue and as it still retained its former staff it was rapidly heading towards bankruptcy. In 1924, part of the staff was discharged but the Town Fund Committee still presented the curious spectacle of existing apparently for the sole purpose of maintaining a cattle pound, the receipts from which were about Rs. 500 while the cost of administration was nearly Rs. 1,700. As the Railway Company still carried on its public services for nothing, the incidence of taxation per head in Myitngè was nil. The future of Myitngè is still undecided, but in May 1925 the Local Government decided that the Town Fund Committee should continue to function. In order that solvency should be maintained, the general administration staff was reduced to a railway clerk employed as a part-timer. The question of excluding all areas except the Railway area is being further examined as the measure of control exercised by the Town Fund Committee over settlers in these outside areas, the sole reason for their

inclusion, has proved to be nugatory. The continued existence of the Town Fund Committee is however, considered desirable as the Local Government is enabled thereby to exert, if necessary, some measure of control in the area.

In 1922 when the area was restricted, the committee was strengthened by the addition of the Executive Engineer, Mandalay and the Assistant Superintendent, Carriage and Wagon Department, Burma Railways, Myitngè. Sixty two per cent. of the present area is the property of the Burma Railways and 92 per cent. of the population are their employees.

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Rural Local Self-Government dates from the year 1922, when the District Council and its subsidiary Circle Boards came into being in supersession of the old District Fund* administered by the Deputy Commissioner. Circle Boards were elected in September 1922 and proceeded to choose representatives to form the District Council which met for the first time in October of that year. The whole of the Maymyo Subdivision is excluded from the operation of the Burma Rural Local Self-Government Act on the ground that its development is not sufficiently advanced to benefit by its inclusion. The remainder of the district is divided into four circles electing Boards with 58 members distributed as follow :—

Amarapura	...	...	16 members.
Patheingyi	...	...	12 members.
Madaya	...	...	17 members.
Singu	...	...	13 members.

The District Council is composed of 16 members: 4 from Amarapura, 3 from Patheingyi, 5 from Madaya and 4 from Singu. The Executive Engineers, both Irrigation and Roads and Buildings, the Civil Surgeon and the Veterinary Inspector, Mandalay, have been co-opted under the provisions of section 7 (6) of the Act.

During 1923 the following number of meetings were held :—

	Number of Meetings.	Attendance of Members.
District Council	9	71 per cent.
Amarapura Circle Board	3	56 "
Patheingyi Circle Board	4	85 "
Madaya Circle Board	3	69 "
Singu Circle Board	1	62 "

* Figures giving the income and expenditure of the old District Fund will be found at page 28 of Volume B of Gazetteer.

The income of the fund consists largely of Government contributions ; the large closing balance at the end of 1923-24 merely indicates that the contribution in aid of Civil works could not be spent in full ; in fact a grant of Rs. 20,000 was made on the last day of the financial year. The main heads of revenue and expenditure were :—

1923-24, *Revenue.*

Opening Balance.	Grants by Government.	Bazaar rent	Fees from slaughter houses, pounds, etc.	Total.
Rs. 180	Rs. 82,000	Rs. 19,893	Rs. 65,660	Rs. 1,12,256

Expenditure.

Office Establishment.	Education.	Public Works	Hospitals.	Total.
Rs. 4,343	Rs. 35,566	Rs. 1,288	*Nil*	Rs. 56,973
			Closing balance.	55,733

Sanitary Works.

Conservancy staffs are enterained in the towns of Amarapura and Madaya ; one Inspector and four vaccinators are employed in the district though the Council are of opinion that they do not get full value for their money from the vaccinating staff. The Circle Board at Amarapura, however, did valuable work during a plague epidemic by personally persuading people to be inoculated.

Civil W

Very little work was done owing to the difficulty in getting skilled supervision and this accounts for the large closing balance. Motorists might perhaps differ from the statement that * " most of the roads being metalled their condition was almost normal to cause traffic possible, " but in any case they are in no worse condition than those of the Municipality.

* Report for 1923-24.

There are four ferries within the jurisdiction of the Council; but they are administered by the Deputy Commissioner, the income realized being credited to the Council.

The District Council also receives shares of the proceeds of ferries managed by local authorities of Kyauksè, Sagaing and Shwebo Districts.

Four veterinary assistants are employed by the Council, one in each circle: but here also the Council are somewhat doubtful of the value of their services.

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ards.

The District Council has appointed 11 of its numbers to form a School Board and has co-opted members of the Education Department to assist with their professional advice. The members of the Board during 1923-24 inspected 87 out of the 97 Vernacular Schools in their charge, which indicates a considerable amount of interest in education on the part of the members.

The income of the Board was Rs. 36,778, mainly consisting of a grant from the District Council of Rs. 33,000 and of Rs. 3,089 from Government. The expenditure was Rs. 36,021, of which Rs. 33,506 was spent on salaries.

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ards.

No separate funds have been created by the District Council for these Boards. They were, however, used largely for inspection work. The Chairman in the report for 1923-24 remarks that these Boards have been acting more as the agents of the District Council than as executive authorities themselves.

On the whole it may be said that the members, both of the District Council and of the District School Board, have manifested a sober realization of the responsiblities which they have shouldered, and have devoted considerable time and labour to the work of local administration. The main difficulty has been lack of funds and consequently the Government grant, which has not been a fixed sum, looms much too large in the Council's financial outlook.

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Commit-

Until May 1924, the Mandalay Cantonment Committee consisted of 10 *ex-officio* members and one nominated non-official Burman member; but the passing of the new Cantonment Act in 1924 revised the constitution so as to introduce an elected element. The present constitution provides for the Officer commanding the station as President *ex-officio*, the commanding officers of the four units stationed in Mandalay, the Senior Magistrate, Mandalay, the Senior Medical Officer of the Cantonment and the Garrison Engineer as *ex officio* members, and seven elected members. Six of the latter represent Burmans and other

indigenous races and are returned by six electoral circles while the seventh represents all other races. The Vice-President is a non-official. Only four of the Burman seats were filled by the election, the two remaining seats being necessarily filled by nomination owing to the absence of candidates. The new Committee met for the first time in October 1924. The work of the Cantonment is performed by an Executive Officer.

Area. Mandalay Cantonment consists of Fort Dufferin, North and East Town, Mandalay Hill, where the British Troops' barracks are situated, and a small area at the shore. Its area is 3,962 acres and it contains a population of 14,057 according to the 1921 Census.

Revenue [and] Expendi[ture]. The total income for 1924-25 was Rs. 83,841 compared with Rs. 64,452 for 1923-24; it is mainly derived from (*a*) Taxation and Land Revenue, (*b*) a contribution from the Municipality on account of a share in slaughter-house fees, cart tolls and hackney carriage licenses, (*c*) sale of grazing and quarrying rights and fees from markets. Taxation consists of a conservancy tax, a water tax and a house and land tax; the incidence is Rs. 1·81 per head.

The total expenditure for the year 1924-25 was Rs. 61,664 as compared with Rs. 61,343 for 1923-24.

The Cantonment Committee maintain four bazaars and a dispensary. The only slaughter-house is that controlled by the S. and T. Depôt exclusively for rations.

There are five Vernacular Schools within the Cantonment area, but the whole of the expenditure is met from a Government grant.

Metalled roads within the Cantonment are maintained by the Cantonment Committee.

Maymyo Cantonm[ent]. In strict parlance, Maymyo Cantonment no longer falls within the category of Local Self-Government areas as it is a Corporation sole, *i.e.*, it is administered by an Executive Officer answerable to the Military Department with no Committee, either nominated or elected, to assist him. It consists of two areas about 2½ miles apart, one for British and one for Indian troops. The population in 1921 was 3,719. There are no private houses nor lands within the Cantonment and no bazaars. Its income in the past has consisted largely of a grant-in-aid and the only tax besides service taxes is a tax on trades. Its income for 1924-25 was Rs. 22,778 and its expenditure 21,287. There are no schools and nothing is spent on education.

CHAPTER XII.

EDUCATION.

Development from Burmese times; Schools at the present day; Secondary Education; Primary Education; Female Education; Training Schools; Educational Administration; University Education.

[Dev]elop-[me]nt from [Bu]rmese [tim]es.

In Burmese times education was almost entirely confined to the monasteries and the instruction imparted was almost exclusively religious. A few lay schools were also in existence which were conducted by old "Sayas" mainly for religious purposes. Before the annexation the Roman Catholic Mission established a Mission in Mandalay and St. Joseph's Roman Catholic Convent was started in 1866. In 1869 the S.P.G. Royal school was founded under the auspices of the S.P.G and the school building was constructed by King Mindôn. Just after the annexation the American Baptist Mission established in 1887 the A.B.M. Boys' Anglo-Vernacular School to which girls were also admitted. By the second year a separate school for girls was begun. The same year (1887) saw the opening of the Wesleyan Methodist Mission Boys' Anglo-Vernacular School with 27 pupils by the Rev. W. R. Winston of the W.M. Mission and of a separate school for girls which was the first girls' boarding school to be established in Upper Burma. To the end of the year 1888-89 the work of the Education Department was confined to Lower Burma. From the 1st April 1889 it was extended to Upper Burma, and Mandalay received the first attention. In 1890 the Roman Catholic Mission founded St. Xavier's Tamil School, Mandalay. When the Government system of education was first introduced to Upper Burma, it was well received; but a few years later an attitude of hostility to secular instruction was shewn by some leading Buddhist ecclesiastics in Mandalay. It is stated in the annual report on public instruction in Burma for the year 1892-93 that "the progress in vernacular Primary Education would have been much greater, if owing to the action of the Mandalay clique of monks, a large number of monastic schools had not been forced to withdraw much against their will. . . . . . I deplore this result because the co-operation of the monks, and the ready way in which they came forward to take the

lead in education, was the most pleasing feature of the introduction of the Government system of education into Upper Burma." In 1893 there were 52 aided public schools, 13 monastic and 39 lay in Mandalay Town and 19 schools of which 8 were monastic in Mandalay District. Since then, owing to the efforts of the Education Department, vernacular education has steadily improved and the opposition of the *pôngyis* has gradually disappeared. Anglo-Vernacular schools continued to increase in numbers. By 1895 St. Joseph's R.C.M. Chinese School was started and two years later St. Peter's High School was established. To meet the needs for trained and qualified teachers in Upper Burma, Vernacular and Anglo-Vernacular, the Government Normal School was opened in 1901 with Vernacular and Anglo-Vernacular practising schools attached to it. In 1902 St. Michael's School for Europeans was established in Maymyo, and during the same year Government took over the aided school privately run by Mrs. C. G. M. Daly and founded the Government Anglo-Vernacular School, Maymyo. In 1906, a separate school for Europeans under the name of Government High School for Europeans, Maymyo, was started. Other schools came into existence, both in Maymyo and Mandalay. St. Joseph's Convent, Maymyo, was recognized. St. Mary's English High School (Church of England) Mandalay and the A. B. M. Anglo-Vernacular Girls' School, Maymyo, were registered in 1915. The Buddhist Schools are represented by the Buddha Thathana Noggaha Schools for boys and girls, opened in 1920 and the three Aided National Schools, two in Mandalay and one in Amarapura, which were recognized by Government recently. To cater for the educational needs of the various Indian communities, the D. A. V. Anglo-Vernacular School, the Khalsa School, and the Muslim Anglo-Vernacular School came into being.

Schools present

At the present time (1924-25) there are 17 Anglo-Vernacular and 3 English Schools in Mandalay; 3 Anglo-Vernacular and 3 English Schools in Maymyo; 1 Anglo-Vernacular School in Amarapura. The number of indigenous schools stands at 202, of which 54 are monastic and 148 lay, including 78 schools in Mandalay Town, 13 of which are monastic. The total number of pupils under instruction in English and Anglo-Vernacular schools is 4,970, and in vernacular schools, 10,416. It should be noted that, a few years ago, Government deliberately followed a policy of eliminating the unfit schools with a view to secure

efficiency. This policy resulted in the disappearance of many inefficient schools, mostly monastic. This explains why the number of monastic schools is not large. The Vernacular Education Committee has recommended that monastic and lay schools should both be treated alike. It is to be feared that monastic schools will gradually drop out from the list of schools recognized by Government.

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Higher education is well provided for in English and Anglo-Vernacular Schools. There are 12 High Schools with 3,377 pupils and 14 middle schools with 1,532 pupils. The demand for English education is growing every year as evidenced by the fact that almost all the schools have increased in enrolment. The majority of the schools are well-housed, well-organized and well-supervised. The following schools had over 250 pupils in attendance in 1925:—

Kelly High School, Mandalay ...	475 pupils.
A.B.M. Girls' High School, Mandalay	270 ,,
St. Joseph's Covent English High School, Mandalay	329 ,,
St. Peter's English High School, Mandalay	350 ,,
W. M. M. Boys' Anglo-Vernacular High School, Mandalay	347 ,,
Buddha Thathana Noggaha Boys' High School, Mandalay	450 ,,
Aided Central National High School, Mandalay	357 ,,
St. Michael's English High School, Maymyo	286 ,,
Government Anglo-Vernacular High School, Maymyo	427 ,,
Government English High School, Maymyo	284 ,,

Vernacular high schools number only 2 with 168 pupils, while the middle schools number 33 with an enrolment of 2,451 pupils. Owing to the demand for English education, the number of vernacular secondary schools has not much increased, but the quality of the schools has steadily improved.

ıary cation.

Primary education for the education of the masses is given in the indigenous Schools There are 1 7 such schools with an attendance of 7,797 pupils There is only one Anglo-Vernacular school with 61 pupils. Mandalay Town

is well provided with schools and education is flourishing. In the rural areas the Amarapura township with 33 schools is the most advanced educationally, Next comes Singu Township with 31 schools; Madaya township and Maymyo subdivision have 23 schools each. Patheingyi township which is the most backward has, only 14 schools.

The progress that has been made in female education is gratifying. In Burmese times there was scarcely any facility for the education of girls. In 1893 there were only 1,862 girls under instruction in the Mandalay District of whom only 183 girls received English education in three Anglo-Vernacular Schools. There are now (1924-25) 5,868 girls under instruction; 607 in English, 662 in Anglo-Vernacular, and 4,599 in Vernacular schools. Special Girls' Schools have been opened by the various Missionary Societies, and in these institutions, Needlework, Domestic Economy and Singing have received much attention. In connection with the progress made by Burmese girls in Anglo-Vernacular education, the Superintendent of the A.B.M. Girls' High School, Mandalay, states that "the passing years have seen great changes in the attitude of the public towards Female Education." Twenty years ago a girl who had passed the Anglo-Vernacular Seventh Standard was regarded almost as a prodigy, but now education is being sought by all classes, and many girls are being given the opportunity to attend High School. Since the High Department was opened in this school, 34 have passed the High School Final Examination, during the past seven years. In the sphere of vernacular education also the number of purely girls' schools has arisen to 40 with an enrolment of 1,974 pupils. Female Education.

To provide facilities for the training of teachers the Government Normal School, Mandalay, was opened in 1901. Anglo-Vernacular candidates are trained to qualify for the Anglo-Vernacular Teachers' Final Certificate, while Vernacular candidates are trained for the Vernacular Teachers' Certificate. Girls who have passed the Anglo-Vernacular Seventh Standard Examination are also trained for the Kindergarten Certificate after a two years' course of training. Training Schools.

To meet the need for qualified teachers in the rural indigenous schools, Elementary Training Classes have also been established. There are five such classes in Mandalay as detailed below:—

(1) Elementary Training Class attached to the Government Normal School.

(2) Elementary Training Class attached to Ma They's Vernacular School.

(3) Elementary Training Class attached to St. Joseph's Convent.

(4) Elementary Training Class attached to St. John's Convent.

(5) Urdu Elementary Training Class for Mahomedans.

Educational Administration. The district forms part of the Mandalay Education Circle which is in charge of one Inspector of Schools with headquarters at Mandalay. For the supervision of indigenous schools the Mandalay District has been divided into three sub-circles, each under the charge of a Deputy Inspector of Schools, namely (i) Mandalay Town Sub-Circle, (ii) Mandalay " A " Sub-Circle comprising the Amarapura and Maymyo Subdivisions; (iii) Mandalay " B " Sub-Circle comprising the Madaya Subdivision. The two latter Deputy Inspectors have each a Sub-Inspector of Schools under them stationed, respectively, at Maymyo and Singu. The Deputy Inspector of Mahomedan Schools, who is in charge of the Mahomedan Schools in Upper Burma, is also stationed at Mandalay. A special Deputy Inspector of Schools for Burmese schools in the Mandalay Division was appointed in 1924 with Mandalay as headquarters.

The English and Anglo-Vernacular Schools are entirely under the control of the Education Department, the Inspector of Schools taking charge of them. The indigenous schools were under the direct control of the Department till 1917, when the control with some reservations, was transferred to the Divisional School Board. With the introduction of the Burma Rural Self-Government Act, 1921, the Divisional School Board system was abolished, and the control and administration of vernacular education is at present vested, within certain defined limits, in the Local Education Authorities constituted under the Act. The various Local Education Authorities in the Mandalay District are :—

(i) Mandalay Municipal School Board for schools within the Mandalay Municipality.

(ii) Mandalay Cantonment School Board for schools within the Cantonment area.

(iii) District School Board, Mandalay, for schools in the "included" area of the district.

(iv) The Deputy Commissioner, Mandalay, for schools in the excluded area of the Maymyo Subdivision.

(v) Maymyo Municipality for schools in Maymyo Town.

(vi) Myitngè Town Committee for Schools in Myitngè Town.

While the powers and functions of educational officers in respect of vernacular education is limited, the Department has practically unlimited advisory powers in reference to matters for the administration and control of which the local education authorities are responsible.

An intermediate College in Mandalay controlled by the University of Rangoon, to provide University education for Upper Burma, was instituted on the 15th of June 1925. The Governing Body is composed of a President, an Executive Member who is the Principal of the College, two members to represent the University of Rangoon, and four other members, two of whom are members of the College staff. The College occupies two disused buildings of the Agricultural College, and has erected a timber building for use as a students' common room. A few of the students are permitted to reside in the hostel of the Agricultural College. The courses offered are English, Mathematics, History, Chemistry, Physics, Pali and Burmese. The staff consists of a Principal, who is also Lecturer in English, 5 Lecturers and a Demonstrator. At present there are 30 students on the rolls. University Education.

CHAPTER XIII.

Public Health.

General Health of Town and District; Vital Statistics, Chief Diseases; Water-supply; Vaccination; Conservancy; Hospitals.

If statistics may be relied upon, neither the District nor yet the Town of Mandalay can be said to be really healthy. The death rates both for urban (with the exception of Maymyo) and rural areas compare unfavourably with the averages for Upper Burma: with the exception of the neighbouring district of Kyauksè, the mean death rate of the past five years for rural areas of the Mandalay District is the highest of the districts which return vital statistics in Upper Burma (Katha, Bhamo, Myitkyina and the Upper Chindwin are not included in the general tables); it is higher than any district in Lower Burma. For the five General Health of town and district.

years ending with 1923 the mean death rate per thousand of population has been 30·88 against a mean for Upper Burma districts of 22·96. Mandalay and Myitngè towns also possess high death rates, the mean for the past five years ending 1923, being 50·40 for the former and 51·28 for the latter against a mean of 41·73 for all towns in Upper Burma. In the case of Myitngè these figures are at first sight a little difficult to understand as it is a railway community possessing a Town Committee with none but Government and Railway officials as members. The Railway Company maintains a hospital and also carries out all essential sanitary services and provides a water-supply so that a very favourable death rate is to be expected. The explanation is that the population is small, under 3,500, so that deaths of patients, non-residents of Myitngè, brought to the Railway hospital for treatment have a considerable effect on the death rate per mille of the inhabitants proper. As all bad cases from the Mu Valley line are brought into Myitngè, because there is no railway hospital at Sagaing, this apparent anomaly is explained. The same explanation may also account for some small part of Mandalay's high figures as the Mandalay General Hospital is a large and well equipped one and serious cases from outside the district do come for treatment there ; the average number per year is 380 ; as the population of Mandalay town, including Cantonments, is large, over 148,000, it is obvious that at least 148 deaths per year of hospital patients from other districts is required to raise the death rate even one per mille. A scrutiny of the figures for deaths from various diseases shows that a large proportion of the difference in the death rates between the Mandalay and other Upper Burma urban areas is due to two causes ; respiratory diseases and "all other causes." The former figure, 9·04, for Mandalay is 2 higher than for other urban areas while deaths from all other causes is 24·50, nearly 4·5 higher than for other urban areas. Tuberculosis is known to be particularly prevalent in Mandalay Town. In the case of the rural area of the Mandalay District the whole of the difference is accountable for by deaths from fever and "all other causes" ; the figures are respectively 14·59 and 14·63, approximately 6 and 2 higher than the figures for other rural areas in Upper Burma. Irrigation and the nearness of the foothills of the Shan plateau to all parts of the district account for the prevalence of fever, which is particularly bad in the Singu township. The

extensive fruit gardens of Madaya also are notoriously malarious. A graph plotted to represent the number of deaths occurring in the whole of the Mandalay District throughout the year, month by month, for a mean of five years starts high up in the month of January and shows a slight drop in February, a rise again in March and another drop in April, and thereafter becomes a more or less smooth curve with a minimum in July and a fairly steep rise in November and December, the latter being the most unhealthy month of the year. Both plague and fever exact their greatest toll in the cold months while small-pox and respiratory diseases and cholera flourish in the hot weather. In the rains nearly all diseases are at a minimum with the exception of dysentery and diarrhœa which reach a slight maximum in June and July; this is explained by the fact that at the beginning of the rains surface impurities are swept into the water-supply.

Vital Statistics

Births and deaths are recorded in all towns of the Mandalay District. They are recorded by *thugyis* who send one counterfoil to the Civil Surgeon. The high percentage of deaths from all other causes, especially in Mandalay Town, would appear to indicate that diagnosis of the cause of death is not as accurate as it might be. The birth rate, both in Myitngè and Mandalay towns and in the rural areas, is higher than the average for Upper Burma. The rates for the past five years in Mandalay and Myitngè average 43·11 and 60·00 against a figure of 33·96 for all towns in Upper Burma. Myitngè has the highest birth rate in Burma. For rural areas there is not such a great difference, the rate being 37·45 against 35·13 (for four years ending 1923). For the past ten years the birth rate of the whole district has been 38·66 against the Upper Burma mean of 35·12. Infantile mortality is very high in Mandalay averaging 334·21 for the past four years against an average in Upper Burma towns of 301·19; though the last two years, for which figures are available, 1922 and 1923 show a decrease, 309 and 324 respectively; this is very possibly due to the efforts of the Society for Infant Welfare though it is also possible that more efficient registration, since vaccination work has been detached from registration work resulting in a higher proportion of births being registered, has also had an effect on the figures. It is interesting to note that in 1920 when there were 5,550 births registered in the town, 950 were attended by qualified midwives with an infantile death rate of 159, while among the 4,600 infants

born under the care of untrained "*wun swès*" there was a death rate of 350. Connected with the high rate of infantile mortality is the high rate of deaths of the mothers in child bed, 11 per 1,000 births compared with the English rate of four. Figures for rural areas are nearly worthless owing to the custom of not registering the births or deaths of infants who die shortly after births; but for two years for which figures, such as they are, are available, 1921 and 1923, Mandalay District had an infantile death rate of 225 againt a provincial average of 165 for these two years.

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eases.

Malaria.—This is the chief and most important cause of sickness in the rural area of Mandalay as has been commented on above; it is also one of the most important cause of deaths in the town of Mandalay; the mean of the last five years of deaths caused by fevers, of which malaria claims 72 per cent., is 6·44 per 1,000 against a figure of 6·13 (30 per cent. of which are due to malaria) for all towns of Upper Burma.

Cholera.—This disease is present in the district almost every year with a greater intensity every third or fourth year. It claims its victims from the town of Mandalay and from villages along the river and railway line. The incidence of deaths during the past five years, however, is comparatively small being ·47 and ·33 for urban and rural areas respectively which do not differ materially from the averages for Upper Burma.

Small-pox.—This disease is also to be found in the district nearly every year. The type of the disease is often mild, but it takes a sudden virulence in some years and causes a large number of deaths especially among the unvaccinated and among those who have not been protected by re-vaccination. 1919 was such a year with a mortality of 1,051, 67·28 per cent. of all reported cases, the mortality among those who had been vaccinated being 60 per cent., and among unvaccinated 85 per cent. No deaths occurred among the re-vaccinated.

Plague.—Plague is mostly confined to towns and to large, crowded and dirty villages. It is common in Mandalay and Maymyo towns and in the Amarapura township. It made its first appearance in 1906 and has been present with greater or less intensity since then, the cold weather and the beginning of the hot weather being the worst time. It appears to visit Mandalay Town with a severe epidemic every other year; this is presumably due to the increase in rats, the rat population not having had

time to recover during the year immediately following the epidemic. Inoculation is carried out during the plague season and the people resort to it fairly freely. The mean death rates for the past five years have been ; Mandalay town 5·23 per thousand, rural 0·17 against averages for Upper Burma of 3·97 and 0·19.

Respiratory Diseases.—As has been stated these exact the largest toll of any group of diseases in Mandalay town ; in the rural areas the incidence is a trifling 0·15, though how far this is due to faulty diagnosis is not ascertainable. Pthisis and Pneumonia are the chief diseases of this group accounting for 19 and 31 per cent. of the deaths from respiratory diseases.

Water-supply.

The sources of the water-supply, except in Maymyo and Myitngè, are the Irrawaddy and its tributaries, canals and wells. In Mandalay there are a few tube wells and part of the town gets its supply from this source. Maymyo possesses an up-to-date water supply from reservoirs. There is little doubt that the water-supply from rivers and surface wells, especially in Mandalay, is a cause of intestinal troubles. During a cholera epidemic this is especially marked and experience shows that a town with a proper water-supply escapes very lightly at such times. The district figures both for Mandalay Town and rural areas do not, however, show much divergence from the averages for Upper Burma as the conditions are much the same all over Upper Burma.

Vaccinatio

The Vaccination Act is not in force in the district except within Municipal limits and in Cantonments. Four vaccinators and one Inspector are employed under the District Council in areas outside towns while the towns possess their own vaccination staff. The total number of vaccinations performed in 1924 was 13,221 as compared with 6,771 ten years ago in 1914 A Sub-Assistant Surgeon under the control of the Civil Surgeon is entertained every year and visits any village in which any epidemic has broken out. He also supervises the sanitary arrangements at the various festivals.

Conservancy.

Maymyo possesses a septic tank and Sewage farm. In the last report of that municipality the septic tank was stated to be out of order. Mandalay possesses an efficient removal and trenching system. The villagers of Amarapura and Madaya employ small conservancy gangs paid by the District Council. Elsewhere conditions are the same as throughout Burma.

Hospital.

In Mandalay and Maymyo there are large well equipped hospitals both under the charge of senior members of the Indian Medical Service. Myitngè possesses a railway hospital and there is a small hospital at Madaya. Mandalay hospital has accepted the Hospital Finance scheme, but Maymyo hospital is maintained by Government. At Madaya the hospital is supported mainly by the District Council. There is also at Mandalay a Town Dispensary supported by Local Funds and a Female Dispensary supported by Government; at Maymyo there is a contagious diseases hospital to which the Municipality contributes. There are also hospitals run by private enterprise of which the Queen Alexandra Children's Hospital supported by the S.P.G. and the two Asylums for lepers supported by the Roman Catholic and Wesleyan Missions are at Mandalay. St. Joseph's Roman Catholic Mission to the Chinese in Mandalay also provides a Chinese dispensary. The Yadanabôn Maternity Hospital in Mandalay is supported by private enterprise.

The following table gives statistics of these hospitals for 1924.

Hospitals.	In-patients.					Out-patients.	
	No. of beds available.		Number treated	Daily Average.	Number died.	Number treated.	Daily average.
	Males	Females.					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mandalay	146	56	4,859	188	328	29,570	190
Maymyo ...	78	23	2,071	60	164	22,876	124
Madaya ...	12	7	216	7	11	4,090	22
Maymyo contagious diseases hospital	10	4	5	...	...		...
Q.A.C. Hospital	...	30*	349	12	30	2,376	21
St. John's Leper Asylum.	198	130 40*	308	216	33	14,291	255
Wesleyan Leper Mission Home.	170	60	214	214	22	97	101
Yadanabôn Maternity Hospital.	...		46	...	...	...	...
Dispensaries.							
Mandalay Town Dispensary ...				...	...	8,162	62
St. Joseph's Chinese Dispensary				...	...	1,294	12
Mandalay Female Dispensary				...	...	9,719	81

* Children.

CHAPTER XIV.

MINOR ARTICLES.

Mandalay; Amarapura—Accounts of San Germano, Gouger, Taw Sein Ko, Yule; Modern Amarapura; Madè, Amarapura Subdivision; Amarapura Township; Patheingyi Township; Patheingyi; Myitngè; Madaya Subdivision; Madaya Township; Madaya; Singu Township; Ngasingu; Maymyo Subdivision and Township, Maymyo; Historical Monuments—Tomb of Mindôn, Tomb of Sinbyumashin, Tomb of Mèdawgyi, Tomb of Nanmadawgyi, Tomb of Laungshe Queen, Ruins of Atumashi Monastery, Shwenandaw Monastery, Thudama Monastery, Thudama *Zayat*, Patan *Zayat*, Salin Monastery, Tawyagyaung, Myadaung Monastery, Sandamani Pagoda, Taiktaw Monastery, Manaung Yadana Pagoda, Mahamuni Pagoda, Setkyathiha Pagoda, Eindawya Pagoda, Shwekyimyin Pagoda, Mandalay Kyauktawgyi Pagoda, Kuthodaw, Yadanamyisu Pagoda, Pagodas on Mandalay Hill, Shwegyetyet Pagoda, Taungthaman Kyauktawgyi Pagoda, Patodawgyi, Tomb of Bodawpaya, Bagyidaw and Shwebo, Sangyaung, Shwezayan Pagoda, Shwemalè Pagoda and Cave, Tombs at Amarapura, Moyses Nga U, Fornelli, Martegazza, Lanciego.

Information about Mandalay Town is to be found in nearly every chapter of this Gazetteer; it has therefore not been thought necessary to reproduce it again here. The following however is a description of the *Shwemyodaw*, now officially known as Fort Dufferin. Mandalay

The city walls form a perfect square, the sides of which run due north and south, or east and west; the length of each side is 2,255 yards. This distance was chosen in order that the total length of the walls, expressed in *tas* (one *ta*-7 cubits) might agree with the number of years which had elapsed since the Buddha attained Nirvana, *i.e.*, 2,400. The cubit used appears to have been the large cubit, measuring over 19 inches. There are three gates in each wall, the centre gates bearing exactly north, south, east and west from the palace. At the four

corners of the city, and at intervals of 188 yards along the wall, are bastions surmounted by *pyatthats*, those over the middle gateway on each side having seven roofs, and those over all the other five each. The wall is built of brick in mud mortar and is 20 feet high and 10 feet thick. The top of the wall is crenelated to a height of 7 feet, making the total height of the wall 27 feet. Inside the wall an earthen rampart was thrown up, the earth being obtained by the excavation of a moat. This moat is 135 feet from the walls, and is 250 feet wide and 11 feet deep. Originally there were five bridges, four leading to the four middle gateways, and one to the west-south-west gate; of these the bridge leading to the middle gate on the west side is no longer used. The names of the gates are:—

North-north-west ...	Sitha.
North	Lethein.
North-north-east ...	Manu.
East-north-east	Lunkè.
East	Uteik.
East-south-east	Thaungnyut.
South-south-east ...	Kyunlôn.
South	Kyawmo.
South-south-west ...	Yanni.
West-south-west ...	Kyehmôn.
West	Sishin.
West-north-west ...	Tinsha.

The east gate was the principal gate; that on the west-south-west was considered inauspicious, because it was by this gate that corpses were taken out for burial. The entrance to each gateway is protected by a masonry screen. These screens are $57\frac{1}{2}$ feet long, 17 feet thick and 20 feet high, with crenelations on top. By the side of each screen is a large teak pillar on a plinth, carrying near the top a wooden board on which is carved an inscription giving the exact time of the foundation of the city and the name of the gate. The four middle gates and the four corners of the city are under the protection of spirits whose images were placed in small masonry shrines.

In the centre of the city, round the palace, was a high stockade of teak posts forming an almost perfect square, with four gates; within this, at a distance of about sixty feet from it, and somewhat less in height, was a brick wall running parallel to the stockade on its four sides.

The large space between the city wall and the stockade was divided into blocks by roads running at right-angles

to one another. These blocks contained the residences of high officers of State and others with, around each, the huts of their retainers and the stalls of bazaar-sellers. For further details, reference should be made to the *Guide to the Mandalay Palace* by Mr. Chas. Duroiselle published at the Government Press in 1925.

Amarapura

Amarapura was founded in 1783 by Bodawpaya (1782-1819) who moved the capital to this place from Ava. San Germano who went to Amarapura in that year gives the following account:—

Account of San Germano.

"Badônsachen next turned his attention to securing the succession of the crown in his family, after the example of his brother Zempiuscien. And judging that to set himself up as the founder of a new dynasty would be one of the best means to accomplish his purpose, he resolved to abandon his present capital and to build another, thus the more easily to obliterate the memory of his predecessors, and fix the eyes of the multitude upon himself alone. Pretexts were not wanting to give a colour to this proceeding. It was said that the city and the palace had been defiled by the human blood shed within its precincts, and therefore it no longer became the monarch to inhabit it; and hence it was ordained that a new imperial residence should immediately be constructed. To this proposal none dared to object, and all the Mandarins and royal ministers strove who should best give effect to the orders of the King. As in this country, all is regulated by the opinions of the Brahmins, so that not even the King shall presume to take any step without their advice, therefore was counsel taken of them, and thereupon a site selected for the new city, on an uneven spot three leagues from Ava, upon the right or eastern bank of the river. Here the work was commenced by the erection of the walls. These form a perfect quadrangle each side a mile long; within which is another line of fortification somewhat inferior in height. In the centre was raised the royal palace, almost entirely of teak-wood. The walls are built wholly of brick, cemented with an argillaceous earth tempered with water. They are protected on the north by the river, and on the south by an extensive pool; on the other two sides was sunk a deep fosse. When the work was completed the King went in solemn state to take possession of the city and palace, on the tenth of May 1783, observing many superstitious rites and ceremonies prescribed by the Brahmins. After

seven days he returned to Ava, in order personally to urge the removal of all his subjects to the new capital; which he effected on the fourteenth of the next month. thus were these miserable inhabitants compelled to quit their home with all its comforts and exchange a delightful situation, salubrious in its air and its waters, for a spot infected with fevers and other complaints, from the stagnant waters that surround it. Badônsachen gave to his new metropolis the name of Amarapura, that is city of security and peace. Of the new inhabitants some took up their abode within the walls; and these were for the most part Burmese, and persons attached to the royal family or to the Mandarins; to others were allotted dwellings without the city, whence arose various suburbs or, as they are called by the Portuguese, *campos*. Besides the Burmese the principal foreign nations who occupy special districts are the Siamese and the Casè*who were brought captives to this country in the wars of Zempiuscen and have greatly multiplied in number. Perhaps still more populous is the suburb of the Mahomedan Moors, who have settled in the Burmese capital as in every other part of India. Their profession is mostly traffic, and they enjoy the free exercise of their religion, having many mosques. To these must be added the suburb of the Chinese, whose industry is peculiarly remarkable; and that wherein the Christians dwell. The entire number of the inhabitants of Amarapura amounts to about 200,000. Vain would it be to describe the sufferings and fatigues, the oppressions and exactions which this transmigration caused, to those whose eyes have not witnessed the extreme rigour with which the royal orders are executed."

count of uger.

Bagyidaw (1819-1837) moved the capital back to Ava in 1823. Gouger, who arrived at Amarapura in September 1822, says; "The removal of the palace means, in Burmah, the removal of the entire population of the capital. The nobles did not care about it as they were repaid for the little inconvenience it caused them by filling their pockets from the corrupt distribution of the building sites of the new city and the frequent litigation it gave rise to. To the people it was the source of ruinous loss and discomfort, to which none but an unfeeling despotism would have dared to expose them. It was melancholy to see them breaking up their old habitations and seeking new ones at great cost and labour."

* *Kathè or Manipuri.*

Tharrawaddy (1837-1846) when he came to the throne made Amarapura his capital after a brief residence at Kyauk-myaung, and no further change was made until 1857 when Mindôn (1853-1878) founded Mandalay. Mr. Taw Sein Ko writes enthusiastically of Amarapura at this period, styling it, " a microcosm of Burmese civilisation." There were congregated not only the wealth, fashion and beauty of the country, but also learning and scholarship. It constituted an Oriental University recalling the splendour, magnificence and intense enthusiasm of Taxila, Benares and Nalanda of ancient days. Metaphysics and religion were taught but scarcely any mathematics, medicine or astronomy. History and poetry were studied, and sculpture, painting, music and the drama were cultivated under the royal patronage. Sanskrit was studied under Brahmin professors from Benares as a language subsidiary to Pāli, the sacred medium of the Southern or Hinayana School of Buddhism. In the domain of art wooden architecture reached its zenith in the reign of Pagan *Min* (1846-53 A.D.).

Account of Taw Sein Ko.

In 1855 Major Phayre was sent on a mission to the Court of Mindôn at Amarapura; the following account of the city is taken from the Narrative written by Colonel Yule, Phayre's secretary :—

Account of Yule.

" The city stands on slightly elevated ground, which in the flood season forms a long peninsula, communicating with the mainland naturally only at the northern end. The city proper of Amarapura is laid out four square, at the widest part of the peninsula. It is bounded by a defensive wall of brick about twelve or thirteen feet high, with a battlemented parapet. Each side has three gates ;* and from eleven to thirteen bastions, including those through which the gates are cut.

* The names of the twelve city gates were :—

North-north-west	...	Yanmyoaung.
North	... ...	Lethein.
North north-east	.	Môku.
West-south-west	...	Alawi.
West ...	...	Sishin.
West-north-west	...	Yanhnin.
East-north east ..	..	Lekyun.
East	...	Uhnein.
East-south-east ...	...	Theinhse.
South-south-east	...	Kyunlôn.
South ...	...	Kônmaw.
South-south-west	..	Nandamu.

The palace occupies the centre, its walls being laid symmetrically with those of the city. It has three successive enclosures. Outside of all is a high palisade of teak posts, and about forty feet within this is a brick wall. On the east side, in which the public entrance lies, an esplanade then intervenes of about a hundred and forty yards in width, succeeded by a second brick wall with a double gateway. There is a gate in the centre of each of the four sides but that to the eastward, or front, only is public.

There are only one or two brick buildings of any prominence within the Palace precincts. The most conspicuous is a square tower, said to have been erected as a treasury by King Tharawadi, the top of which is crowned with a gilt pavilion which serves as a belvedere, where the king occasionally amuses himself at eventide with a spy-glass. The powder magazine is still maintained within the Palace walls, notwithstanding the alarming explosion in Tharawadi's time, which is sometimes said first to have decidedly unhinged that prince's mind. It stands in the south-west corner of the outer yard.

A large square pagoda marks each angle of the city just within the walls. They are all similar in plan but that at the north-west angle only is gilt. The streets are very wide and in dry weather are tolerably clean. There are however no public arrangements for street cleaning and the dogs are the only scavengers. There is no attempt at drainage; consequently in wet weather the streets are deep in mire and some of the lower parts of the town are absolutely swamped. The great majority of the houses are mere bamboo cottages slightly raised from the ground on posts. The passages of the most frequented gates are favourite stations for the stalls of petty traders. Booths for similar goods are ranged against the corners of the Palace palisades and at the very gate of the palace is the principal mart for the stationers who deal in *parabeiks* and steatite pencils.

The houses of the Princes, the Ministers of State, and other dignitaries, generally occupy the areas within the blocks, into which the rectangular streets divide the town. The best, such as that of the Crown Prince, are extensive and elevated timber structures, somewhat similar to the monasteries, but in plainer style; with double and triple roofs (allowed only to the Royal family), boarded or covered with small slate like tiles. Others are neatly

made of bamboo mat panels framed in teak, with carved teak eaves, and gables ends, and roofs of thatch. Here and there in the vacant spaces under the ramparts are large barn-like buildings distinguished by the royal roof. These are the king's granaries.

The approximate number of houses within the walls was found to be 5,334, giving a probable population of 26,670; and the whole capital, including the immediate suburbs, was found to contain 17,659 houses, giving a population of about 90,000. The *Woon-dauk* on one occasion was pleased to state the number of inhabitants at ten million, and this he said was no guess, but an actual enumeration made when the king on coming to the throne presented every man, woman, and child with a piece of clothing. But a much larger and denser population occupies the western suburb which nearly fills the projection of the peninsula from the city walls to its termination at the Sagyinwa Creek. The streets are laid out with something of the same regularity as in the city, but with less width, and are lighted by a more healthful amount of life and activity away from the immediate shadow of the royal lamp. These main streets near the fort constitute the quarter in which foreign residents chiefly dwell. Native subjects, it is said, are not allowed to build brick or stone houses without the king's permission, nor is it agreeable to the habits and prejudices of the Burmese to do so. But there is no prohibition of the kind affecting foreigners and consequently numerous brick houses are to be found in the foreign quarter, and there only, except in that occupied by the Chinese.

Artisans and traders in the same article cluster together in groups and give their names to wards, but are not strictly confined to one locality. You find perhaps a dozen ironmongers together and a dozen dealers in gongs and other articles of bellmetal and copper, but you will find similar groups of the same trades in other parts of the town. The dealers in silk however, which form the most important article of local manufacture, seem concentrated in one bazaar at the most populous centre of the western suburbs, near to the *Pato-dau-gyi*.

From the eastern part of the northern wall of the city and along the narrowest part of the peninsula two parallel roads run north towards the *Maha-myat-muni* temple; this is about two miles from the city gates and is the most popular place of worship in the metropolis or its neigh-

bourhood. The most westerly of these roads is that thronged by the holiday worshippers and abounds in shops for cheap articles of clothing. Here too are most of the brass founders and the marble cutters whose bells and images are most likely to find purchasers from folk bound on errands of devotion. The second road to the Aracan Temple is an elaborate raised causeway paved and parapetted throughout with brickwork. For a great part of the distance this causeway is bordered on both sides with monastic buildings, and among these are structures undoubtedly the most magnificent in the whole country and on which the utmost resources of Burman art and wealth have been lavished."

ern, rapura.

Shortly after Phayre's embassy Amarapura ceased to be the capital and the "City of Immortality" is now in a state of utter ruin. It is known to Burmans as *Myo-haung*, what is now known as Amarapura being styled by them *Taungmyo*. All that now remains of the Palace are two masonry buildings, a *Pangôn* or watch tower and a *Shwedaik* or Treasury. On the south of these is what appears to have been a royal indigo factory. Present-day Amarapura is the headquarters of a subdivision and of a township. It has been notified as a Town under the Towns Act but has no Committee to administer it; it is under the Disrict Council. Its population in 1921 was 8,497.

è.

Madè, which is perpetuated in the name of the *Madè-ekin* quarter of Mandalay, was situated on the river bank at a point where "D" Road now meets the embankment and was a place of resort for Chinese caravans. In Crawford's journal it is stated that there was a Custom House there in 1826. Chinese merchants arrived there from Bhamo in the month of December and a kind of fair was held there for a few months. The Chinese brought tea (from Shan States), silk, silver and gold, and pots of iron and copper and exported cotton. Yule also mentions it as existing in 1855, and states that Chinese caravans also visited this place at other times of the year, coming *viâ* Hsenwi or even Kentung.

apura ivision.

AMARAPURA SUBDIVISION is the south-west subdivision of the district. It is bounded on the west by the Irrawaddy, on the north by the Madaya Subdivision, on the east by the Maymyo Subdivision and on the south by the Myitngè. It contains the Amarapura and Patheingyi Townships. In 1921 its population was 80,252.

Amarapura Township is the southern township of the subdivision of the same name. It is bounded on the north by Mandalay Town and by the Patheingyi Township; its remaining boundaries are those of the subdivision. Its population in 1921 was 47,928.

Amarapı Townshi

Patheingyi Township is the northern township of the Amarapura Subdivision. It is bounded on the south by the Amarapura Township and by Mandalay Town; the remaining boundaries are those of the subdivision. Its population in 1921 was 32,324.

Patheing Townshi

Patheingyi is the headquarters of the township of that name. Its population is 603. It is within 5 miles of Mandalay.

Patheing

Myitngè is a railway town in the Amarapura Township. A full description of it will be found in the chapter on Local Self-Government.

Myitngè

MADAYA SUBDIVISION comprises the northern part of the Mandalay District. Its northern and western boundaries are those of the district. Its eastern boundary is the Chaungmagyi as far south as the Maymyo Subdivision, after that the boundary of that subdivision; the Amarapura Subdivision forms the southern boundary which runs from the river Irrawaddy a little north of Mandalay through Kabaing on the Shwetachaung to the Dinga *chaung*, which it follows more or less as far as Yadanabônmi, where it crosses the *chaung* and runs in a north-easterly direction to a point just north of where the Shwelaung *chaung* crosses the Mandalay Canal; thence north-east to Sugaungnet, and from there east to the foot-hills where it turns southwards for four miles and then runs east to join the Maymyo Subdivisional boundary. It comprises the townships of Singu and Madaya. Its population in 1921 was 93,295.

Madaya Subdivis

Madaya Township is the southern township of the Madaya Subdivision. Its northern boundary is the Chaungmagyi, which separates it from the Singu Township. Population in 1921 was 51,038.

Maday Townsh

Madaya, the headquarters of the subdivision and township of that name, is a large village situated on the east bank of the Shwetachaung which separates it from the famous fruit gardens with which its name is associated. The town suffered during the disturbances caused by Bo Zeya after the Annexation, being twice attacked by him in the autumn of 1886. On the first occasion he was beaten off by the *Myowun* Maung Ka, but on the second

Maday

occasion it was burnt to the ground together with the adjacent villages of Uyindaw and Thayettan. Madaya has not yet been constituted a town and is administered by the District Council. It possesses a small conservancy gang; there is a fairly large bazaar but no slaughter-house which was recently abolished by the District Council. The population has increased very little since the annexation and numbers 2,958; the majority of the garden workers however live in the gardens. There is one rice mill in Madaya. A branch of the S.P.G. has been established there.

Singu Township. Singu Township is the most northerly township in the district; its east, north and west boundaries are those of the district, the Chaungmagyi forming its southern boundary. It contains many valuable fisheries which affords employment to several hundred persons. Its population in 1921 was 42,157.

Singu. Nga Singu, the headquarters of the Singu Township, is mentioned in the *Hmannan Yazawin* as one of the 43 forts which Anawrata built as a protection against the Shans. The place was named after Nga Sin, the hunter, whose history, as given in the Chronicle, is as follows:—"So Kyansittha abode at Htilaing Village and mustered his forces and sought for the hunter Nga Sin. And the hunter Nga Sin, hearing that Kyansittha sought for him was afraid and he crossed to Ngasingu and fled. The place is still known as Ngasingu. The place where he split the cutch and made himself a bow is still known as Shagwe. The place where Kyansittha made search for him is still known as Sheinmaga. The place where Nga Sin, the hunter, was caught, is still known as Ngasingaing. Htihlaingshin Kyansittha, when he had won the Htihlaing headman and the hunter Nga Sin, mustered his forces and held court in eleven villages in the south. Ngahtihlaing held court at Ngahtihlaing; the place is still known as Ngahtihlaing. The place in the south where Nga Sin, the hunter, held court with his army is still known as Ngasingaing." Narapatisithu (1173-1200) founded the Shwemôktaw Pagoda at Ngasingu. A ballad describes the foundation in 1274 A.D. of a fort, 250 *ta* square, with six gates named as follows:—

North-north-west	...	Biluma.
North-north-east	...	Manidwaya.
East-north-east ...	...	Sandaguha.
East-south-east ...	...	Webula.
South ...	...	Sekkhupala.
West-south-west	...	Gômbika.

The wall, remnants of which can still be seen, was two cubits below and seven cubits above ground, with four *tazaungs* and eight *pyatthats*. If the date is correct the fort was built about the time of the murder of Kubla Khan's ambassadors by Narathihapate. An inscription in the precincts of the Shweyattaw Pagoda records its construction at the instance of a monk by the people of Ngasingu, between 1641 and 1644; this was in the time of *Pye Min* of Ava. It is a village administered by the District Council. Its population in 1921 was 1,524.

Maymyo Subdivision and Township.

MAYMYO SUBDIVISION AND TOWNSHIP are co-terminous and form the south-eastern part of the district. The subdivision is shaped like a ham with the knuckle bone pointing northwards. It is bounded on the west by the Amarapura and Madaya Townships, the boundary lying a few miles in from the edge of the plains, and on the south by the Myitngè which sweeps convexly southwards in a large curve. On the east the Shan States of Hsum Hsai (Thônzè) and Möng Löng form the boundary. On the north and south there are masses of hill ridges, but in the centre is an undulating plateau traversed from south-west to north-east by the road and railway. A few peaks rise above 4,000 feet, but the average altitude of the plateau is between 3,000 and 3,600 feet. There are several passes from the hills to the plains on the west and south of the subdivision. The inhabitants of the subdivision are mainly Danus and Shans. There are five places within the subdivision at which five-day bazaars are held :—Maymyo (which also possesses a daily bazaar), Pyintha, Singaung, Nalin and Wetwun. The population in 1921 was 34,257.

Maymyo.

Maymyo is the headquarters of the Maymyo Subdivision and Township. It lies nearly due east of Mandalay Town, about 30 miles as the crow flies, but 42 miles by road.

The town of Maymyo is so called after Colonel May, whose regiment, the 5th Bengal Infantry, was stationed there in 1886. Previously the place was known as Pyinulwin and the name of the Civil Station remained thus till 1897, though the name Maymyo had been officially applied to the Military Post there as early as 1887. The construction of what was intended to be the Mandalay-Kunlôn Ferry Railway drew attention to Maymyo as a possible hill station. In June 1896 Mr. D. M. Smeaton, I.C.S., Officiating Chief Commissioner, accompanied by

the Chief Engineer, visited Maymyo and decided that its elevation, situation, and climate were suitable. The opening of the railway to Maymyo was delayed until 1st April 1900, but meanwhile building sites were laid out and demarcated, the drainage was improved, and the town was provided with metalled roads. In 1904 after prolonged experiment the headquarters of the British troops was transferred to Maymyo from Mandalay. The population of the town has grown rapidly from 1,259 in 1901 to 16,558 in 1921. In 1889 a station was established on the Maymyo-Lashio Road to the east of the town for the registration of the trade between Mandalay and the Shan States. Before the opening of the railway there was heavy traffic by road; in 1896-97, 4,697 pack-bullocks, 1,212 pack mules, 11,178 carts and 10,548 pack coolies, carrying goods to an estimated value of Rs. 20,63,176, were registered on their way to Mandalay. The chief articles brought were wet and dry tea, and cheroot wrappers. During the same period the exports to the Shan States by this route were valued at Rs. 20,76,574; they consisted of salt, salt fish, cotton and woollen goods, and iron.

Maymyo lies at the head of a valley with an area of 17 square miles and is surrounded almost entirely by low hills of which the highest is One Tree Hill (4,021 feet). The business quarter of the town is at the centre, alongside the Mandalay-Lashio Road, and contains a bazaar, Post Office and Telegraph Office. On the outskirts are the residential quarters; the British Infantry Lines are on the east and the Indian Infantry Lines on the west. A lake has been made by damming up the southern end of the valley and a Park and Botanical Garden have been laid out round it. An electric light supply has recently been provided. There is a hospital with 74 beds and a Railway Dispensary. The schools are (i) for boys—a Government English High School, a Government Anglo-Vernacular High School and an Anglo-Tamil Primary School, (2) for girls—St. Joseph's Convent European School, St. Michael's European School for Girls and an American Baptist Mission Anglo-Vernacular Girls' School.

orical uments.

Tomb of Mindôn, on the north-east of the Palace. It was originally a brick *pyatthat* plastered over and whitewashed, erected by Thibaw to the memory of his father. The *Sawbwa* of Yawnghwe obtained permission to decorate the tomb with glass mosaic.

Tomb of Sinbyumashin (died 1900), at the north-west corner of Mindôn's tomb. She was the daughter of Bagyi-daw (1819-1837) and the mother of Supayalat, Thibaw's queen.

Tomb of Nanmadawgyi (died 1876) on the north of the Palace. She was the daughter of Tharawadi and Mèdawgyi, and the chief queen of Mindôn. She had no children. It is said that she was learned in history and astrology, and was the constant adviser of her husband.

... *Tomb of Laungshe Queen* (died 1870), due north of Mindôn's tomb. She was the daughter of the *Mônè Bohmu*, queen of Mindôn and mother of Thibaw.

Ruins of the Atumashi monastery, south of the Kuthodaw Pagoda. This monastery (known to Europeans as the Incomparable Pagoda) was built by Mindôn in 1857 at a cost of five lakhs of rupees as a mark of respect for his father, whose throne he placed there. The building was of wood, covered with stucco on the outside, and consisted of five graduated rectangular terraces instead of the usual pyramidal *pyatthat*. In it was enshrined an image of the Buddha, made of the silk clothes of the king and covered with lacquer, the dimensions being those prescribed in the Buddhist scriptures. In the forehead of the image was a diamond weighing 32 rattis, which was presented to Bodawpaya by Mahanawrata, Governor of Arakan. In this monastery were deposited four complete sets of the Tripitaka. During the disturbances which followed the Annexation the diamond disappeared, and in 1890 the building caught fire and its contents, with the wooden frame-work, were destroyed.

Shwenandaw monastery, on the east of the ruins of the Atumashi monastery. It was built by Thibaw in 1880, mainly of the materials obtained by dismantling the apartments occupied by Mindôn just before his death, and cost about Rs. 1,20,000. The whole building is heavily gilt, and adorned with glass mosaic work.

Thudama monastery, on the south-west of the Kyauktawgyi pagoda. It was built by Mindôn in 1868, to be used as a refectory when ecclesiastical convocations were held in the Thudama *zayat*.

Thudama zayat, on the north-east of the Thudama Monastery. It was built by Mindôn in 1859, at the same time as the Palace. It was used for holding ecclesiastical convocations and housed the highest ecclesiastical tribunal. The annual Patamabyan examination was held in it, and

in 1902 the election of the *Thathanabaing* was held near it.

Patan zayat, on the north of the Thudama *zayat*, as an annexe of which it was used. In it Pāli hymns were chanted by the monks who attended an ecclesiastical convocation.

Salin monastery, on the west of the Kyauktawgyi pagoda. It was built in 1876 by the Salin Princess, eldest daughter of Mindôn who, as *Tabindaing minthami*, was intended to be the queen of the next king. When her place was usurped by Supayalat she became a nun. The carving with which this monastery is adorned is probably the finest in Burma, and is a good example of work which has not been contaminated by European influence.

Tawyagyaung, on the south-west of the Palace, as an annexe to which it was built in 1859. It consists of a cylindrical pagoda, surrounded by a number of chapels of which the eastern is the most important, because in it the oath of allegiance was administered to officials. The entrance to this chapel is decorated with plaster figures of mythological monsters.

Myadaung monastery, on A Road, is known to Europeans as the Queen's Monastery, because it was built in 1885 by Supayalat, Thibaw's queen. It was finished in a hurry in November of that year just as the British troops were on their way to the Palace. It is a very fine specimen of Burmese architecture.

Sandamani pagoda, on the east of the Thudama *zayat*. This pagoda contains the graves of Mindôn's younger brother, who was his heir-apparent, and of several other princes, all of whom lost their lives in the Myingun Rebellion of 1868. It also contains an iron image cast by Bodawpaya in 1802 and brought from Amarapura by Mindôn in 1874. Each year in October a festival is held in its honour and is largely attended by the descendants of the Heir-Apparent. The Buddhist Commentaries are being carved on stone slabs, and set up round the pagoda. It is estimated that rather more than 800 slabs will be required, each slab costing Rs. 83, including the carving.

Taiktaw monastery, on the north-east of the bridge over the moat outside the *Uteik* gate. It was built by Mindôn in 1859, and before the Annexation was used as the official residence of the *Thathanabaing*. The posts were brought from the palace at Amarapura. The carving on this and the neighbouring monasteries is considered to be bolder

and to belong to an earlier and better style than that of the Shwenandaw and Myadaung monasteries. The interior is heavily gilt.

Manaung Yadana monastery, at Wagingôn, a village on the east of Mandalay. This pagoda was built in 1881 by Thibaw on the model of the Kuthodaw pagoda; it is said to have been the last pagoda that he built and he is known as Manaung Yadana *Dayaka*. It has recently been repaired and regilt by public subscription with the consent of Supayalat.

Mahamuni pagoda, known to Burmans, as the *Payagyi* and to Europeans as the Arakan pagoda, is near Shanzu railway station. It is so called because it contains the Mahamuni image which was brought from near Myohaung in 1785 as a spoil of war. The image is of metal and represents the Buddha in a sitting posture, with the legs folded under the body; it rests on a masonry pedestal, six feet ten inches high. Its dimensions are:—

	Feet.	Inches.
Height. ...	12	7
Round the waist ...	9	6
Round the arms ...	4	11
Breadth from shoulder to shoulder ...	6	1
Breadth at base ...	9	0

In order that it might be transported to Burma, the image was divided into three parts, which were floated down on rafts to Taunggôk in Sandoway District. A road was made, and the parts were put on sledges and dragged by manual labour over the pass to Padaung in Prome District, whence they were taken by river to the capital. The Mahamuni image is reputed to be of very great antiquity, and to be a portrait of the Younger Brother of the Buddha. To possess it was for seven centuries the ambition of the kings of Burma; it is an object of fervent adoration to all Burman Buddhists. The pagoda has a terraced roof of gilded stucco which is of recent construction; the original roof was burnt in 1884. Four entrances facing the cardinal points lead to the central shrine. The passages are adorned with frescoes; those on the north side illustrate the bringing of the image from Arakan. In the inner courtyard are a number of stone slabs, inscribed, by order of Bodawpaya, with copies of inscriptions recording religious endowments. Not far from the western entrance is a group

of six bronze figures, two of men, three of lions, and one of a three-headed elephant. These were brought from Arakan at the same time as the Mahamuni image; they are part of the spoil which Bayinnaung took from Ayuthia in 1663, and the Arakanese King Razagyi from Pegu in 1660. Dyspeptics seek to cure their ailment by thrusting their fingers into the navels of the human figures and twisting them round and round. The galleries leading to the central shrine are lined with stalls, at which brass-ware, gongs, toys, and statuettes are displayed, and are thronged by a gay crowd of many races. On the south-east of the shrine is a large tank of turtles. The Mahamuni image was accompanied by numerous captives, who were afterwards settled in Mandalay. In the court on the north-east of the pagoda is a stone inscription recording the manner in which the image was brought from Arakan.

Setkyathiha pagoda is in 85th Street, a few hundred yards north-east of the Myadaung monastery. It contains a bronze image of the Buddha, even larger than the Mahamuni image, which was cast by the orders of Bagyidaw at Ava in 1823, just before the outbreak of the First Burmese War. In 1849 the image was removed to Amarapura just before the outbreak of the Second Burmese War, and in 1884 it was removed to Mandalay, just before the outbreak of the Third Burmese War. It is considered, in consequence, that the removal of the image presages a national disaster. The dimensions of the image are :—

	Feet.	Inches.
Height ...	16	8
Round waist ...	11	10
Round arms ...	5	9
Breadth from shoulder to shoulder ...	7	6
Breadth at base ...	11	5

Eindawya pagoda is on the west bank of the Shwetachaung, to the north-west of the Setkyathiha pagoda. It was built in 1847 by Pagan, on the site of a summer house in which he stayed before he came to the throne. The shrine is of fine proportions, and is gilt from top to bottom. When the capital was at Amarapura a long avenue of trees led from the palace to this pagoda. The most sacred object in the shrine is the *Mahuya paya*, a black stone image of the Buddha which is a copy of the famous image in the *Maha-Bodhi* temple at *Bodha-gaya*. The image was damaged in 1910, when nearly half the

pagoda was destroyed by fire. It was given to Bagyidaw by the Mahant in charge of the temple, and was first kept in a chapel at Ava, whence in 1843 it was removed by Shwebo and placed in a pavilion within the precincts of the Manichula pagoda at Amarapura ; finally it was placed in its present position in Mindôn's reign.

Close to the Setkyathiha pagoda on the east is a small pagoda built on the site of her old house by Shinbomè ; a famous beauty who was the wife of five successive kings.

Shwekyimyin pagoda is in 23rd Road. It is said to have been built by Minshinsaw ; it was built in 1852. In one of the chapels are kept certain images of the Buddha, twenty-five feet high, carved by Mindôn's orders out of a single block of Sagyin marble. The figures of the eighty disciples of the Buddha are ranged round the central shrine, twenty on each side. The carving of the image was completed in 1865, and the ceremony of dedication was performed with great rejoicing on the 16th of May, Mindôn himself being present. A description of the royal procession, with contemporary illustration, has recently been published under the title " Pageant of King Mindôn." The king's intention was to construct a pagoda on the model of the Ananda pagoda at Pagan, but this was frustrated by the outbreak of the Myingun rebellion in 1866 and the corrugated iron roof as it is now seen was put on by the *Sawbwa* of Yawnghwe.

Kuthodaw or Mahalawka-mayasein pagoda is on the east of the Kyauktawgyi pagoda. It was built in 1857 by Mindôn on the model of the Shwesigôn pagoda at Pagan. Grouped round the main shrine are 729 stone slabs, on which have been carved the whole of the Tripitakas. On the north of the Shwekyimyin pagoda is the *Payani*, so called from the colour of one of its predecessors ; it is said to be built on the site of a shrine erected in 1092. It is interesting chiefly because it contains the Myatsaw Nyidaw Naungdaw images which were brought from Toungoo about 1785. During the disturbances following the Annexation they were stolen from Mandalay Hill and, after being stripped of the gold with which they were covered, were thrown into the valley ; where they were found by a monk, and regilded by the townspeople.

Yadanamyisu pagoda is beyond the Shwetachaung on the north side of C Road. It is said to have been built by Minshinsaw and repaired in 1478 by Thihathura, and to be still of the original shape.

On the highest point of Mandalay Hill is a pagoda which once contained the Nyidaw Naungdaw image now kept in the Payani. It is said to have been founded by Alaungsithu. Lower down at the southern end of the ridge stands a huge image known as the Shweyattaw. The original image, which was erected by Mindôn at the foundation of Mandalay, was burnt down in 1892. It represents Buddha pointing to the Palace as the future centre of a capital.

Shwegyetyet pagoda, at Amarapura Shore, is said to have been built by Asoka as a shrine of relics of Gaudama, who once lived near this spot as King of the Fowls. Rebuilt by Anawrata (1044-1112), Narapatisithu (1175-1210), by the mother of Tarabya (1323-36), by Minkyiswasawkè (1368-1401), by Sinbyushin (1763-76, and by Bodawpaya (1782-1819). There is an inscription on the platform which records the fact that Tarabya's mother rebuilt the pagoda, placed a *ti* on it, constructed a monastery, and dedicated land and slaves.

Kyauktawgyi pagoda, near Taungthaman village, opposite Amarapura on the other side of the Taungthaman Lake. It was built in 1847 A.D. by Pagan (1846-1852) on the model of the Ananda pagoda at Pagan. It is the best preserved of the numerous religious buildings at the deserted capital of Amarapura and exemplifies a type of architecture which though borrowed from the Indian designs of Pagan was constructed entirely by Burmese architects. The artistic interest of the temple lies in the numerous frescoes with which its four porches are adorned. They represent religious buildings in various styles of architecture built or repaired by Pagan *Min* at Sagaing, Amarapura, Ava, Pakangyi, Prome and Rangoon and the planets and the constellations according to Burmese ideas of astronomy. The human figures depict the dresses and costumes of the period. Mr. Ch. Duroiselle says: "There is in the spandril of the arch of the east porch just within the monument a beautifully executed fresco which is frankly European in conception and execution. The painting represents two angels, Christian angels, though rather scantily clad (a concession perhaps to the climate) with outspread wings on each side of the spandril, on the left a male and on the other side a female. Should all the other details be Burmese, the wings alone would be sufficient to indicate Western influence. The features are thoroughly European as well as the coiffure, the hair of

which is golden; the colour of the body delicate pink and white; the very way the draperies are arranged is not Burmese; the ornament in the middle of the spandril from which the draperies depend, which the angels are holding, resembles an urn, is Western in design, and is never found in Burmese painting or plaster carvings. There are also found in the spandrils above the arches on the outer face of the walls of the main shrine small angels in plaster carving almost in the round and with outspread wings, European faces, etc., of whose Western origin there can be no doubt."

Patodawgyi, near Amarapura Railway Station, was built by Bagyidaw in 1816 A.D. It is the largest and most handsome of all modern pagodas in Upper Burma, consisting of five successive square terraces surmounted by the immensely elongated pile of the pagoda.

White marble panels with inscribed bas-reliefs are let into the walls all round the three lowest terraces. They illustrate partly grotesque scenes and partly stories from the Jatakas.

Tombs of Bodawpaya (1781-1819), *Bagyidaw* (1819-1837) and *Shwebo* (1837-1846). These are on the south and east sides of the deserted city of Amarapura. The bodies of the kings were cremated on the sites of the so-called tombs, and the ashes were thrown into the Irrawaddy.

Sankyaung, south-east of Myohaung Railway Station, consist of the Mèdaw and Thamidaw monasteries, which were built in 1837-1846 during the reign of *Shwebo min* by his chief queen and his daughter who became the chief queen of Mindôn *min*. These monasteries were alloted as the residence of U Nyeya who was *Thathanabaing* under both Shwebo and Mindôn. The carvings on them are noted for their beauty, refinement of detail, and a remarkable sense of proportions which could not be reproduced in later times.

Shwezayan pagoda, near the village of that name on the banks of the Myitngè, is said to have been built in 416 B.E. by Sawmunhla, one of Anawrata's wives, who was banished to the Shan States. The legend says that the pagoda was built facing east, towards the Shan country of Maw, where Sawmunhla was born. Anawrata heard of this and sent messengers with instructions to kill her. They arrived at dusk, and she put them off until the morning. In the night she took her scarf and

with it twisted the pagoda round so that it faced west towards Pagan. The Glass Palace Chronicle says that Anawrata offered 1,000 *tas* of land adjoining the pagoda and that in 485 B.E. Alaungsithu offered the land and villages bounded on the east by the Thambaya stream, on the south by the Myitngè, on the west by a *yinmabin*, on the far side the Pan stream, and on the north by the Nakè stream and Nakè Hill. He also dedicated fifty families as slaves of the pagoda. In the reign of Mohnyin *min* the pagoda was repaired and the height raised to 30 cubits. In the reign of Singu *min* it was repaired by the king's mother, gilded down to the ground and provided with a golden *ti*. It has recently been rebuilt by public subscription under the superintendence of U Kanti, the hermit of Mandalay Hill. There is a local tradition that the hill on which the pagoda stands was, before the time of Sawmunhla, known as Mywemingôn (Snake King's Hill). There is an annual festival at this pagoda during the waning of *Tabaung*. The festival is famous because at this time a number of very large fish appear in the Myitngè below the pagoda. The legend is that these fish are the incarnations of the queens who poisoned Anawrata's mind against Sawmunhla so that he sent her back to Maw. They falsely pretended that she was a witch, and as a punishment are compelled to come and worship at the pagoda. The fish arrive about the 10th waxing of *Natdaw* and are fed by the villagers of Shwezayan until the festival. During the festival the visitors feed the fish, which go away after the Burmese New Year's Day. The fish are nearly all of the kind called *Ngahtwe*. There are said to be a few *ngaywe* (the large cat-fish) and *ngathalein* (a red fish). About thirty *ngahtwes* appear; they are all about the same size, three to four feet long, black with no scales, and have very wide flat mouths. They also have a pair of whiskers or antennæ. In the early morning they come right up to the water's edge and allow people to touch them and drop balls of bran into their mouths. It is said to be possible to stick gold leaf on to their heads. The same fish come year after year. While the *ngahtwes* are in the neighbourhood fishing in the Myitngè is suspended. A fisherman from a village on the Kyauksè side is reported to have dreamed that a *ngahtwe* came to him and said: "On my way to the Shwezayan festival I have been caught in your trap. Let me go and I will go into your trap on my way back." He found the

fish in his trap and let it go; on its way back he caught and killed it. He and the villagers who helped him to catch and eat it all got leprosy. The reference is apparently to a village near Tabetswè the inhabitants of which suffer from yaws. The fish do not appear at any other place in the Myitngè except at Môndaw (on the west of Shwezayan) where they stop at another pagoda for a short time on their way down the river in April.

The *Shwemalè pagoda* is supposed to have been built by Shin Malè with the assistance of Thagya *min* and Wisagyôn *nat* to enshrine seven relics of the Buddha. Alaungsithu (1112-1167) dedicated land and villages to the pagoda. The boundaries are given in an inscription on the pagoda platform, and everything within them, paddy land, dry land, streams, weirs, tanks, gardens, was devoted to the support of the pagoda. In 918 B.E. a rededication was made by Sinbyushin (1551-1581) of land and 136 house-holds of slaves; there were 172 men, 168 women, 173 boys and 105 girls, in all 618 slaves, whose names are given. In 955 B.E. Minyèkyawswa rededicated the land and slaves and was followed in 1175 B.E. by Bodawpaya who set up the present inscription on the pagoda platform. The status of the pagoda land was investigated at Original Settlement. Mr. Westlake wrote; "The only orders I can find existing on the subject are those of the Township Officer dated the 22nd November 1890, in which he authorises Maung Kyi to collect a tithe of the profits on all paddy land, garden, tanks and fisheries within the Kyauktaing *kwin*, to take a commission on the revenue so derived, and to spend the revenue itself on sacred works connected with the Shwemalè pagoda. Maung Kyi, it appears, is the head pagoda slave of the *wuttagan* land devoted to the Shwemalè pagoda in 252 B.E. In the first place the *Myoôk* says the revenue is to be spent on repairs to the pagoda, whereas the greater part of it is annually spent on *pwès* and feasting, which is not repairing the pagoda and which was not the intention of the founder when he said *Alôk akywe athôn athin* was to be the duty of the pagoda slaves. When one comes to the pagoda and sees a paltry one of not more than five *pos* plain mortar and no gilding one wonders what has become of the thousands of baskets of paddy that have been collected for the last thousand years. The *thugyi* suspects that the few *payakyun* who are left have misappropriated it. But Maung Kyi is most modestly

housed and dressed. But then what has become of all the pagoda slaves who once existed and who were once counted by villages and have now dwindled down to a handful of villagers ? The position of pagoda slaves is hateful and despised among Burmans. Therefore one cannot help thinking that every year the revenue derived from the land is (a large part of it) given up to freeing a certain number of the class from their low position and setting them up as traders in some part of the country where their antecedents would be unknown. I now come to the distinction between *ayadaw* and *bobabaing wuttagan* land. The latter are of course the *wuttagan* lands obtained on mortgage centuries ago by private persons from the original slaves. There are only one or two holdings of pure *wuttagan* land cultivated by acknowledged slaves. *Ayadaw wuttagan*, the *thugyi* complains, pays one-fourth part of its outturn to the State and one-tenth to the pagoda slaves, and he says it cannot be cultivated at this price. It became *ayadaw* thus. In the year 1214 two *payakyuns* quarrelled over their land and killed one another. The Magwe *mingyi* held the enquiry and pending settlement of the murder case he held the land *pendente lite*, in deposit as it were. There being no murderer left the case remained adjourned *sine die* and the land remained *ayadaw*." At the present time, in addition to the rent (which is supposed to represent a third of the gross produce) the tenant of *bobabaing* land has to pay a tithe of the balance of his produce to the trustees of the pagoda. Payment is enforced by the Civil Courts. In Shwebandaw *kwin* an area of 94 acres has been allotted to the pagoda as *wuttagan;* this was intended to replace the tithe levied on the large dedicated area which is demarcated by stone pillars. This *wuttagan* land pays one third of its produce as rent to the pagoda trustees. *Ayadaw* land which has been cleared since the Annexation pays no tithe. The amount of tithe payable by the tenants appears from the account of the pagoda trustees to be assessed very leniently. The pagoda has been gilded since Mr. Westlake wrote. Near the Shwemalè pagoda is a cave, called by Yule in his narrative, the Oungmeng Cave. He thus describes his visit to it :—

"Nearly 8 miles from Tsengoo, crossing the Malè Khyong, a clear mountain stream, we soon reached the valley of Malè at the mouth of a valley running up some miles into the hills. A gay group of temples crowned

the termination of a jutting spur above us, up which we mounted by a paved and parapetted ascent. Descending behind the temple we walked a mile, by a path through meagre forest, to the cave, which is situated on the neck joining the spur on which the pagodas stand to the hills behind. Having reached the entrance we sat down awhile, whilst the guides manufactured torches of dry bamboo fasces.

The descents to the cave are two, both by ladders, by one of these and by a short sloping passage, descending to a depth of 25 feet or so from the entrance, we found ourselves in a hall of considerable size and some 40 or 45 feet in height. We then turned into a narrow closet, where the suffocating smoke of the bamboo torches almost made us give up the undertaking, ascended another ladder, went on our hands and knees to traverse a low passage, crossed a chasm on ricketty poles, and then through another contracted passage emerged on a second considerable chamber. There were some large sheets of stalactite here, and masses of stalagmite, but the limestone did not appear to be of a kind to form stalactite freely, and the usual icicles and fanciful pinnacles and mouldings of a limestone cavern were almost wanting. In some natural stalactic niches at one end of the chamber were enshrined a few small gilt Gautamas, and before them hung a thick screen of pendant stalactite, which when beaten with a mallet gave forth a dull drum-like sound and supplied the place of the bell in Buddhistic places of worship. We could not find or hear of any passage leading further. The whole extent of the cavern was probably not more than 90 or 100 yards. When we asked jocularly before entering the cave whether there were any *bilus* there, the people answered " No ; there is a *phya*." The latter they seemed to think a perfect antidote against evil beings. Emerging from the cave, we descended the other side of the ridge and returned to Malè by a better road."

Moys U.

The Rev. Father Moyses Nga U, a Burman from Chaungu village, was sent to Rome for his education, and was ordained priest there. He lived at Rome for thirteen years. He was at Amarapura during the Second Burmese War, and was put in jail by Pagan *min* as an offset to the ill-success of the Burmese troops, and on account of his faith. When peace was made Mindôn *min* let him go, but he died on the 12th October 1852, a few days after his release, as a result of the ill-treatment he had received

and of a spear-wound. His tombstone, which was erected by Donna Augusta Lanciego and the Brothers, is inscribed thus—" D. Moyses Nga U Ex pago Kiaun-u Sacerdos alumnus S. Cong. P. Fidei—Miss. Ap. Mor. D. XII Oct. ann. MDCCCLII Suoe XXII."

rnelli.

The Rev. Father Thomaso Fornelli, a native of Cirie in the diocese of Turin, belonged to the Congregation of the Oblates of the Blessed Virgin. The date of his arrival in Burma is not known. He died at Ava on the 12th February 1852 at the age of 35. His tombstone was erected by Donna Augusta Lanciego, probably a daughter of Don Gonzalez de Lanciego. The inscription reads—D.O.M. D. Thoma Fornelli Pede Montanus Obl. B.M.V. Miss. Ap. in reg. Birmano. Mor. D. XII Fer. ann. MDCCLII Suoe XXXV. Dna. Aug. Lanzieg. Posuit."

ntegazza

The Rev. Father Gaetana Mantegazza, a native of Milan, of the Congregation of the Barnabites, came to Burma in October 1772 and was put in charge of the mission at Chanthaywa . He soon learnt Burmese, opened a school and started a seminary at Mônhla. In July 1777 he escaped to Ava, having been threatened with death for having struck an impertinent boy, the son of an excommunicated Christian. Not long after he became reconciled with his enemy and settled at Mônhla. In 1780 he moved the seminary to Nabet. In January 1784 Mantegazza, who had been elected Bishop Co-adjutor four years before, sailed for Italy to receive Episcopal consecration. He took with him a Buddhist monk, named Gianmaria Za U, who had been converted to Christianity and with his help published at Rome a Burmese alphabet.

He was consecrated at Vercelli in Piedmont on 12th December 1786 and in January 1787 sailed from Genoa for Burma. On the 9th of February 1788 he arrived at Pegu and later visited Ava and Bassein. In 1794 he travelled all over Burma to hold confirmation services ; but when he arrived at Amarapura, broken down by fatigue, he fell sick and died on the 11th of August 1794 at the age of 49. The inscription on his tombstone reads :—" D.O.M. D. Caet, Mant. Milan, Fp. Maximonio Politano Vic. Ap. in reg. avoe Peg. and Coet. Mor. D. II Aug. ann. MDCCXCIV Suoe XLIX."

Harvey, quoting Bigandet, calls him Maung Saw and says he was the first Burman to visit Europe. This alphabet was apparently a revised edition of Father

Melchior Carpani's published at Rome in 1776, and was itself revised in 1787.

Don Gonzalez de Lanciego, a Spaniard, was sent when a boy to Paris, where he was educated and afterwards lived for several years. At the outbreak of the French Revolution he went to the Isle of Bourbon of which his uncle was governor. There he fitted out a privateer and with it attacked English tradeships. His vessel was driven into Bassein by bad weather; he left it, made his way to Rangoon and set up as a trader. He married a daughter of an Indo-Portuguese called Jhansey, who was for many years *Akauk-wun* or Collector of Customs at Rangoon; another daughter became one of Bagyidaw's queens. From Rangoon he went to Ava and was subsequently appointed *Akauk-wun* at Rangoon. Gouger, who met him there in 1822, says he was "a man of liberal education, having been brought up in his own country to the medical profession. He was about fifty years old, of a somewhat irascible but generous temper." When Gouger returned to Burma, he found Lanciego at Ava on his annual visit to present the Port dues to the king. Lancieg

Lanciego gave him a house in his compound, but, when war broke out, found it politic to avoid his company. But eventually they were in prison together. Gouger says: "He had succeeded up to this time, by his alliance with the sister of the second queen, in maintaining his freedom, but now fell before the hatred of the *Pacahm-woon,* who, according to custom, was invested with the whole power of the kingdom. Mr. Lanciego suffered what I had from the first dreaded, but had marvellously escaped—the torture . . A small cord bound the wrists together, and was gradually tightened by the application of a lever. At each wrench he was exhorted to confess and be liberated; but the Spaniard was too old a bird to be caught by that bait. Knowing the consequences of confession, as it was called, he courageously endured the torture to the last. And what was he expected to confess? That he had sold the Island of Negrais to the English for a sum of money, which he was now called on to give up to the king! The agony he endured must have been excruciating, though this was generally looked upon as one of the mildest methods of questioning a culprit." After the peace of Yandabo, Lanciego was released and Crawford met him at Ava. He says: "His property was not restored and he had ever since been excluded from the palace; the only justice done

to him being the acknowledgment of his innocence and the punishment of his false accusers. It seems that his services were now thought necessary in the ensuing negotiation and he was to-day for the first time to be admitted to the palace. . . . His situation was the more to be pitied since he was not permitted to quit the country either alone or with his family. He knew in fact too many of the secrets of the Burman Government and this excited their keenest jealousy and apprehension." On his way up to Ava he had met Bandula and is reported to have said to him : "I will petition His Majesty not to go to War; in the meantime you must march slowly." He failed however to persuade the king of the inevitable result of a conflict. Crawford says he was "a gentleman who was represented by all who knew him as a man of honour and probity." He died in 1838 at the age of 72. The inscription on his tombstone reads :—"Here lies interred the remains of Don Gonzalez DeLanciego Manye Ara Shapendar of Rangoon who died at Amarapura on the 11th day of November A.D. 1838, aged seventy-two years."

APPENDIX A.

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APPENDIX B.

The following is a translation of a document, in the possession of the Wetmasut *wundauk*, which purports to give an account of the yearly revenue received by King Thibaw and of the way in which it was spent :—

RECEIPTS.

	Rs.
Revenue collected from 76 different sources, *e.g.*, sale of licenses for bazaars, customs stations, import stations, ferries; paid in monthly, or every three, four or six months, or yearly.	46,79,802
Thathameda—Collected elsewhere than in the capital and its neighbourhood, the Shan States and Myelat, at an average rate of Rs 10 per house.	36,53,325
NOTE 1.—The total number of houses was 4,74,230, but 68,305 of these were exempted on account of the old age, infirmity or destitution of the householders.	
NOTE 2.—*Thathameda* collected from the slaves attached to pagodas and monasteries, amounting to Rs. 29,764 was not paid into the Treasury, but was used by the Council of State to defray the wages of the watchmen of pagodas and monasteries and of the warders in the *Letmahtauk* prison.)	
Thathameda collected in the Shan States by Shan Chiefs and Feoffees under their own arrangement.	6,00,000
Revenue collected in paddy from King's *kaukkyi*, and *mayin* land in Kyauksè *Kokhayaing* and other places, 8,31,319 baskets converted at Rs. 80 a hundred baskets.	6,65,055-4
Total receipts ...	95,98,182-4

EXPENDITURE.

Salaries.

Members of the Royal family, princes of various ranks, commanders, including those who had a place in the order of precedence and those who had not; persons supported from the Privy Purse, 45 in number.	29,340
Officials of the Council of State, 99 in number	1,50,000
Officials of the Privy Council, 60 in number ...	1,00,680
Officials of the Police Court, 103 in number ...	33,180
Officials of the Women's Court, 24 in number ...	16,440
Officials of the Civil Court, 39 in number	15,840
Governors, Superintendents, Military officers, Court officials, Learned Men, 89 in number.	2,02,464
Officials of the Treasury, Tailor's Shop, Respository of Royal Paraphernalia. Record Keepers, Secretaries, 85 in number.	44,100

		Rs.
Lesser Court Officials, Waiters, Butlers, Betel, Umbrella and Sword Attendants, Permanent, attendants *Yenyun* and *Natshin Yannaung* Guards, Doctors, Masseurs, Snakebite Doctors, Old family Servants, 1,113 in number.		3,08,160
Former Officials of the Forty Rupee Corps, Servants in charge of the Betel Nut Paraphernalia, Negro Servants, 196 in number.		37,680
3 Shan Chiefs, 38 District Commissioners, 16 Assistant Commissioners, 12 King's Messengers, 67 Town Clerks, 6 Chief Constables, 142 in all.		1,96,764
North Dawè ... South Dawè ... North Tayangasè ... South Tayangasè ... North Marabin ... Shwepyihmankin ...	Members of the Six inner units of musketeers, 4,041 in number.	5,65,872
Natsu Left Wing ... Natsu Right Wing ... Ywe Left Wing ... Ywe Right Wing ... Gyaung Left Wing ... Gyaung Right Wing ...	Members of the Six outer units of musketeers, 3,327 in number.	4,65,876
Marabin ... ... Shwehlan ... ... Natshin Ywe ... Naukwingyin ... Linsin Kinda ... Thuyè ... ... Tagani ... ... Bôndawpyit ... Bôndawto	Members of miscellaneous units of musketeers, 4,538 in number.	6,35,472
Members of Artillery units, 795 in number		1,10,220
Kathè ... ... Ekkabat ... ... Yebet ... ... Shwepyiyanaung ... Myinsugyi ... ... Myanma ... ... Shan ... ... Zimmè pa ... Thwethaukasu ... Nauk daw pa ... Lamaing ... ... Nanu mingala ... Mingala Yènyun ... Sidaw	Members of 14 units of cavalry 5,118 in number.	8,62,440

East Win ... ... Left Win ... ... Right Win ... ... West Win ... ... So lesèdaing ... ... Kaunghan ... ... Yun	Members of 7 units of guards 1,582 in number.	2,51,380
Boats ... ... Barges ... ... Ships ... ... Sampans ... ... Punts ... ... Boatmakers	Members of 6 units of water-men, 6,238 in number.	6,67,602

Foreign servants, 26 in number 1,00,920

Old family elephant riders, drummers, time keepers, printers, elephant grass cutters, carpenters (employed without the Palace) carpenters (employed about the royal possessions), persons born on the same day as the King, shield bearers, painters in colours, painters in gold, elephant guards, carpenters in the Treasury, members of miscellaneous units 6[illegible]3 in number, 92,100

Cooks for the King and the monks whom he fed, suppliers of clear water, puppet showmen, Burmese tailors, Shan tailors, Indian tailors, members of miscellaneous units 229 in number. 34,980

Runners, Brahmins in charge of the shrines of the 15 great spirits. Indian masons, goldsmiths, men attached to the Minister of the Treasury, jewellers employed in the Palace, makers of library books, rulers of lines in books, *Mayaman* ivory workers, wood carvers, watchmen of durian gardens, members of miscellaneous units 369 in number. 56,364

Milkmen, forerunners, attendants, makers of royal apparel, *Kaunghan* guards, men employed in the Arsenal, men who spread curtains to shade the King when he halted on a royal progress, feeders of the white elephant, Burmese actors, Siamese actors, players in the Palace band, acrobats, men actually serving as elephant riders, members of miscellaneous units 1,327 in number. 2,02,692

Brahmins in charge of the clock, braziers, niello workers, barbers, gong makers from Shweda, Kanthaya and Halin, watchmen of the Great Council from Hkinu, Tedaw, Sidoktaya and Myothit; Lamp lighters; carriers of presents, guards of stations and stairways, bird scarers, sweepers, messengers of the Women's Court, warders of the Western Prison, workers in 2,59,008

gold thread, button makers, palanquin bearers, watchmen over the white umbrellas, Keepers of presents, watchmen in the Treasury, Tailor's Shop, Record Office, Repository of the Royal Paraphernalia and Charcoal store, ushers for boors and rustics, makers of wooden platters, makers of gunpowder, planters of worm wood trees, gong makers, wood polishers, Officers and sergeants of elephantery, elephant doctors and attendants, officers of the moat and of the gardens, watchmen of the moat and of canoes thereon, grooms and stablemen, gold lace makers, midwives, coachmen, masons in the Treasury, Indian painters, watchmen in the Betelnut Court, comb makers, makers of white folding books, men employed in the gun factory, shipyard engineering shops, weaving factory, dye factory, water works, sugar refinery, betelnut crushing mill, rice mill and furnace; iron smelters from Sagaing; blacksmiths, metal refiners: members of 72 miscellaneous units, 1,514 in number. Instead of which they got paddy at the rate of 100 baskets for Rs. 80 amounting to 323,760 baskets of paddy.

Fifty two warders in the *Letmahtauk* prison, 100 watchmen of pagodas, 120 watchmen of monasteries, members of three units 272 in number.	34,980
Total Salaries ...	54,74,556

The balance Rs. 41,23,626-4-0 was spent by the King on grants and presents to the queens, princes, princesses and ladies of the Court, and in other ways for his private purposes as well as on the erection of pagodas, monasteries and libraries and the support of *pôngyis* and other religious mendicants.

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Mandalay District.

Key to numbers on Map No. 8.

Number.	Name.
1	Kyauktawgyi Pagoda.
2	A-yongan-u-yin.
3	Sandamani.
4	Temporary Palace.
5	Kuthodaw.
6	Mingala-u-yin.
7	Thacawya Pagoda.
8	Myezun Pagoda.
9	Shweyinma.
10	Inwataik.
11	Yakaingpônna.
12	Satta.
13	Wethale.
14	Kawthale.
15	Oninywa.
16	Onin Pagoda.
17	Shwebôntha Pagoda.
18	Bathankyun.
19	Thayethnapin.
20	Yindawkyun.
21	Kaing 67½ pè.
22	Seikkyi.
23	Paukpauktan.
24	Setkyawun bridge.
25	Setkyathiha Pagoda.
26	Kugyi Pagoda.
27	Patodawgyi.
28	Moditaik.
29	Kandawtaik.
30	Sulamuni Pagoda.
31	Bonkyawtaik.
32	Pyitaik.
33	Tagundaingze.
34	U-shwedaung bridge.
35	Ngadolon's Jurisdiction. 450 pè. Taungthaman-in. Jurisdiction pè. Kaukkyi 58-pè. Mayin 312-pè. Kaing 130-pè. Ya-46-pè. Bobabaing-65-pè. Village and monastery 265-pè. Culturable 57-pè.
36	Kyauktawgyi Pagoda.
37	Ngapein bridge.
38	Zalingôn bridge.
39	Bôn-o-bridge.
40	Sagyinwa bridge.
41	Shwegè.
42	Taiksu.
43	Myindaing.
44	Yatasu.
45	Yindawsu.
46	Yinbônsu.
47	Pabèsu.
48	Myindaing.
49	Kôntha.
50	Letpan.
51	Tattawba.
52	Zigôn.
53	Nayisu.
54	Taikso.
55	Sanywe.
56	Chaukthwethauk.
57	Htaminchet.
58	Etaik-in.
59	Kywèthe-in.
60	Kethu-in.
61	Shwegyet Jurisdiction. Shwehlan 687-pè. Kaukkyi 15-pè. Mayin 10-pè. Kaing 106-pè. Bobabaing 98-pè. Garden 56-pè. Villages and Monasteries 334½-pè.
62	Yadanaku Pagoda.
63	Myindaing.
64	Thayetpin.
65	Paungdaw-u.
66	Pabèsu.
67	Hnâsaungbyaingzayat.
68	Teinbya.
69	Bôn-o.
70	Maize and peas. 609-pè.
71	Bônkaukkyi 65-pè. Mayin 73-pè. Culturable 53-pè. Garden 35-pè.

Mandalay District.

Key to numbers on Map No 8.

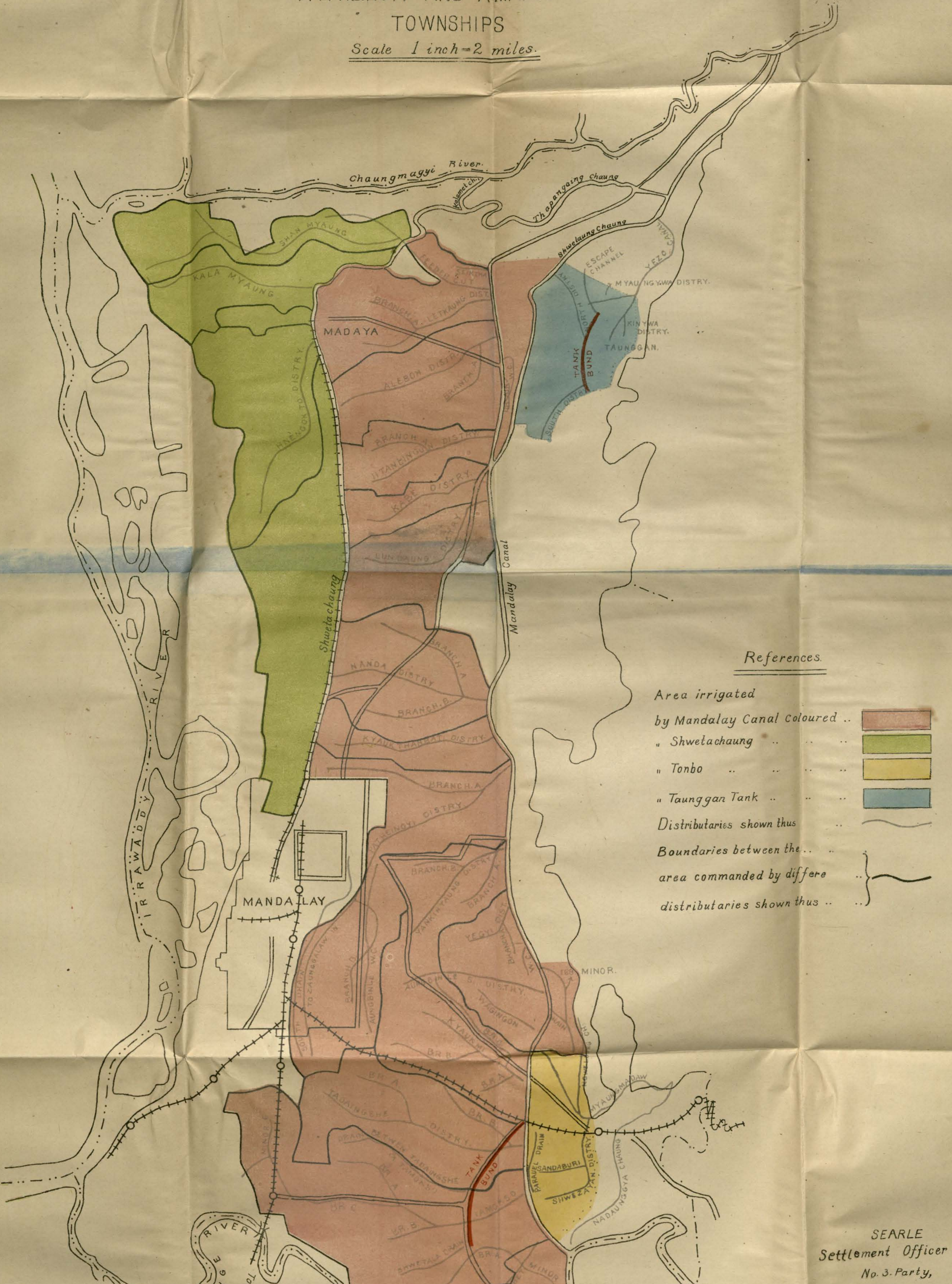
Number.	Name.
71	Bobabaing 153-pè. Villages and hillocks 232-pè.
72	Nandawya.
73	Letkôkpin opening. N. to S. 1824 *ta*.
74	Ngadolon 340 *ta* 120-pè.
75	Ngakywet 304 *ta* 12 - pè
76	Danônywa.
77	Wetmasut Atwinwun. Danônywa Jurisdiction 790-pè. Bônkaukkyi 169-pè. Ya 66-pè. Culturable 69-pè. Garden 48-pè. Bobabaing 34-pè. Villages monasteries and Pagodas 106-pè.
78	Tetseinywa.
79	Shwehlanywa.
80	Nwanosu.
81	Gyobyugôn.
82	Nga Po Maung's. Jurisdiction 790-pè.
83	Pakan.
84	Myitlaung.
85	Wetmasut-A-twinwun 200-pè. Bobabaing 35-pè. Ya 100-pè. Culturable 19-pè. Garden 35-pè. Villages, monasteries and Pagoda 11-pè. Nga Saw's Jurisdiction 200-pè.
86	Linban-in.
87	Htihlaing.
88	Kandwin.
89	Kothin.
90	Ameindawya tank.
91	Shwebawkyun Pagoda.
92	Yèlonkyaw.
93	Chinywa.
94	Indawywa.

Number.	Name.
95	Kaing 150-pè. Culturable 20-pè. Garden 28-pè. Waste and hillocks 19-pè.
96	Hpayèkyun.
97	Banaw.
98	Thabyeôk.
99	Sado.
100	Myittu-in.
101	Letsègan-in.
102	Sinywa.
103	150-pè. Kaukkyi 15-pè. Kaing 36-pè. Bobabaing 93-pè. Waste and hillocks 51-pè.
104	Bothugyi-in.
105	Letpanzin.
106	Thungèdaw.
107	Ywekyubauk.
108	Nga Pwa's Jurisdiction 921½-pè.
109	U-yindaw.
110	Garden 921½-pè. Kaukkyi 125-pè. Mayin 83-pè. Kaing 130-pè. Ya 68-pè. Culturable 30-pè. Garden 334-pè. Villages, monasteries and Pagoda 49½-pè.
111	Gyobyukan.
112	Athon Garden.
113	Plantain cutivation.
114	386-pè. Village and monasteries 69-pè. Kaing 119-pè. Ya 42-pè. Garden 53-pè. Bobabaing 10-pè.
115	Sado.
116	Myothit.
117	Nga Pya 386.
118	Nga Saw 304 *ta* 120-pè.
119	Nga Pwa 304 *ta* 120-pè.
120	Nga Pya 304 *ta* 120-pè.

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MAP SHOWING GOVERNMENT IRRIGATION IN THE MADAYA, PATHEINGYI AND AMARAPURA TOWNSHIPS

Scale 1 inch = 2 miles.



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G.B.&.P.O-No. 511-C.S.13-5-1928-380-L

BURMESE MAP OF COUNTRY BETWEEN
MANDALAY HILL AND MYITNGÈ



H. F. SEARLE,
Settlement Officer,
No. 3 Party,
MANDALAY.

G.B.C.P.O.—No. 571, C.S., 21-1928-380-L